LATINO RESIDENTIAL SEGREGATION IN THE UNITED STATES:

APPLYING NEW METHODS TO GAIN NEW UNDERSTANDINGS

A Dissertation

by

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ABSTRACT

This study examines the residential outcomes of Latinos in major metropolitan areas using new methods to connect micro-level analyses of residential attainments to overall patterns of segregation in the metropolitan area. Drawing on new formulations of standard measures of evenness such as the Dissimilarity Index and the Separation Index, I conduct micro-level multivariate analyses using the restricted-use census microdata files to predict segregation-relevant neighborhood outcomes for individuals by race. I term the dependent variables segregation-relevant neighborhood outcomes because the differences in average outcomes for each group on these variables determine the values of the aggregate measures of evenness. This approach allows me to use standardization and components analysis to quantitatively assess the separate contributions that differences in social characteristics and differences in rates of return make towards determining the overall disparity in residential outcomes – that is, the level of segregation – between Whites and Latinos.

Based on my micro-level residential attainment analyses I find that for Latinos, acculturation and gains in socioeconomic status are associated with greater residential contact with Whites, in agreement with spatial assimilation theory, which promotes lower segregation. However, my standardization and components analyses reveals that a substantial portion of White-Latino disparities in residential contact with Whites can be attributed to differences in rates of return; that is White-Latino differences in the ability to translate acculturation and gains in socioeconomic status into more residential contact

with Whites. This can be interpreted as the role of discrimination which is emphasized by place stratification theory. Therefore I conclude that while members of minority groups can make gains in residential outcomes that reduce segregation by attaining parity with Whites on social characteristics as spatial assimilation theory would predict, a substantial disparity will persist as Latinos cannot translate those gains into greater contact with Whites at the rate that Whites can. At the aggregate level of analysis, this means that White-Latino segregation remains substantial even when groups are equalized on social and economic characteristics.

To all of my loved and loving family and friends.

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CHAPTER I

INTRODUCTION

Residential segregation is one of the most visible and fundamental signifiers of social stratification, reflecting and perpetuating social boundaries that allow for structures of inequality to develop and produce long-term consequences. In the U.S., these boundaries are particularly salient along the lines of race, ethnicity, and class. Segregation along these boundaries has broad and important implications for life chances as neighborhood-based resources are distributed unevenly and can create systematic disadvantages by race and class. Racial and ethnic residential segregation in particular is both a product and driver of majority-minority inequalities and disparities on a wide array of social and economic outcomes. For this reason, racial-ethnic residential segregation and its causes are a great concern to social scientists, resulting in a vast and growing literature that focuses on neighborhoods and the spatial distribution of populations by race and ethnicity.

This literature is dominated by studies of White-Black segregation due to its centrally important role in the racial and ethnic history of the country. Social problems affecting the Black population continue to be the most deeply embedded and widespread, and residential segregation is especially one of the more long-standing of these problems. As a result, studies of residential segregation have traditionally and understandably focused most often on levels and trends of White-Black segregation. However, over the past several decades the demography of the United States has been

changing in a dramatic way – the rapid emergence of the Latino population is now the driving force behind U.S. population growth and movement. As of the most recent census, conducted in 2010, Latinos are now the largest racial-ethnic minority in the United States with one of the fastest population growth rates[1].

Because Latinos are a fast-growing and increasingly important racial-ethnic minority population, social scientists have turned their attention to questions regarding the social problems that Latinos face with a particular focus on disparities in socioeconomic status, education, health, and of course, residential outcomes. The condition and status of any racial or ethnic group in the United States can be assessed to some extent by focusing on these major factors associated with life chances, socioeconomic outcomes, and inter- and intra-generational social mobility. However segregation above all not only serves as a basic metric for race relations but also has far reaching consequences that feed back into the other aforementioned issues. For instance, living in a residentially segregated neighborhood, particularly a neighborhood segregated from Whites whose neighborhood resources and property values are generally more favorable, is typically associated with greater exposure to environmental health hazards, poor educational quality in schools, greater exposure to crime, and inferior labor market opportunities (Charles 2003). This in turn exacerbates preexisting group disparities in a variety of social outcomes and can serve to perpetuate them within and across generations.

[1] In this study I refer to Latinos as a racial, ethnic, and racial-ethnic group interchangeably. This is due to their complicated status as a group that is defined along both racial and ethnic lines. The debate on whether Latinos are an ethnic or a racial group is ongoing in the literature, and the goal of this study is not to contribute to that debate but to instead to analyze observable residential patterns of this group regardless of whether they are defined as an ethnic or a racial group.

Because of these concerns, describing and analyzing the residential outcomes of major racial groups in the United States is an important objective for the social sciences. For Latinos in particular, their role as the driver of population growth and movement calls for a greater amount of attention for two main reasons. The first is that it is substantively important in its own right, as the Latino population has taken on great demographic importance but has been less widely studied and thus warrants greater consideration in the research literature, especially in studies of residential segregation where the residential patterns of Latinos previously have been given only limited attention. In the past decade or so, major contributions have been made by scholars in the social sciences towards increasing our understanding of the residential patterns and outcomes of Latinos (Frey and Farley 1996; Hall and Stringfield 2014; Iceland and Nelson 2008; Lichter and Johnson 2009; Lichter, Parisi, Taquino and Grice 2010; Massey and Denton 1989), but this is only a start and there is more work still to be done. Specifically, we need more comprehensive studies of the factors that lead to Latino residential segregation and we also need better coverage of areas where Latinos have begun to settle in recent decades, such as the Southern and Midwestern regions.

The second main reason why it is important to study the residential outcomes of Latinos is that they have emerged as the most demographically dynamic ethnic group in the United States, rapidly dispersing across the country and growing significantly in relative presence nearly everywhere that they are located (Saenz 2010). Their diversity, their settlement into new areas, and the attention that has been turned to them as a racial-ethnic minority all happening in real time allow us as social scientists to take the full

apparatus of existing theories on racial and ethnic segregation and see where White-Latino segregation fits into the theoretical frameworks that have been developed over time based on historical studies of first White ethnic segregation and then White-Black segregation..

Many of our existing theories on racial and ethnic relations were developed during the 20th century with a much needed and necessary focus on the Black population as their experience in America transitioned from slavery to the era of Jim Crow and then into the post-Civil Rights era. Segregation research especially focused on the Black population during this time because of the deeply institutionalized and at one point legal imposition of segregation of the Black population that has persisted at very high levels to this day, as well as the effect that the Great Migration has had on changing patterns of neighborhoods in cities in the Northern and Midwestern regions of the U.S. which even today have some of the highest levels of White-Black segregation (Lieberson 1981; Massey and Denton 1989). Out of these experiences of the Black population came studies that strived to explain the residential patterns of Blacks in the South where Jim Crow reigned (Massey and Denton 1993), and in the North where a sudden and rapid in-migration of Blacks resulted in Whites deliberately and systematically separating themselves from Blacks residentially leaving them concentrated in disadvantaged and neglected parts of their cities as can be observed in Chicago and Detroit (Lieberson 1981). In addition, the literature has continued to observe these areas over time to see how these patterns have changed, either for better or for worse or if in fact they are remaining stable (Iceland et al 2002). This is a rich literature examined from nearly

every angle and we know much more about race relations as a result. However, it is time now to take what we know from studying Black segregation, as well as White ethnic segregation of the early 20th century, and turn our attention to Latinos as they grow as a population and disperse out of traditional settlement areas and migrate to new parts of the country. The experience of Latinos in the U.S. is in many ways fundamentally different from that of the Black population due to different regional and cultural origins. In addition, Latinos have a unique and complex history with the U.S. that varies tremendously within the Latino population depending on national origin.

We need to evaluate segregation in the areas with a long-standing Latino presence as well as areas that are only just experiencing the settlement and growth of a Latino population. In addition, we need to assess how unique aspects of the Latino population such as diverse language usage, a wide array of nationalities and racial subgroups, and a considerable foreign-born population that varies in time spent in the United States (with a significant population having only been in the U.S. for less than two decades) affect the overall residential patterns of the population. Does speaking a language other than English or being foreign-born serve as a barrier to sharing neighborhoods with Whites? And what happens to residential patterns as foreign-born Latinos learn English and acquire U.S. citizenship in addition to making socioeconomic gains? For the predominately English-speaking, U.S.-born Black population, these particular factors have been a relative non-issue and thus in the traditional segregation literature they remain mostly unexplored in comparison to what could be known with an

ethnically and culturally diverse population, good data and an appropriate method of analysis.

The first purpose of this study therefore is to address the inadequacies in the current literature and increase our understanding of Latino residential outcomes in order to not only inform Latino sociological and demographic research but also to contribute to the study of racial and ethnic relations in general. However, there is a second but equally important purpose of this study, which is to apply methodological innovations that will make it possible to explicate the structure and nature of White-Latino segregation in greater detail and sophistication than has previously been possible. Without delving into the full details of this objective, which will be described in later chapters, the issue is this: past studies of residential attainments and segregation have been limited both by the methods of analysis and the data that are publicly available in ways that have prevented researchers from establishing the quantitative linkages between micro-level social processes of residential location and overall patterns of residential segregation.

As a result, research on residential outcomes has up until now been conducted on two separate and analytically distinct levels. One is the macro-level, where studies of residential segregation describe aggregate patterns of cross-area variation in segregation and analyze these patterns using contextual level variables measuring community characteristics, oftentimes constructing these contextual variables to capture the effects of social processes operating at the micro-level. The other level of research consists of micro-level studies of residential attainments, which analyze how individual residential

outcomes are related to individual social characteristics that are relevant for socioeconomic attainment and social mobility. To date these micro-level studies could not directly inform aggregate-level studies because researchers did not have methodological techniques that could quantitatively link individual-level outcomes to the aggregate patterns of segregation analyzed at the macro-level. The consequence of this limitation is that while the two levels are intrinsically linked and intuitively we know that segregation is driven by social processes that are operating at the micro-level, these lines of research have no way of communicating directly to one another.

As mentioned previously, this limitation can be attributed both to limited methodology and inadequate publicly available data. In regards to methodology, segregation is measured and conceptualized at the aggregate level, focusing on area – usually census tract – deviations from exact even distribution, specifically, deviations of tract-level group proportions from group proportions for the city. The computing formulas used for obtaining index scores were originally developed to be used with tract-level data such as summary tabulations of race counts produced and distributed to the public by the US Census Bureau, not data for individual-level residential attainments. Because of this, the popular formulas used to calculate and measure segregation obscure the connection between segregation at the aggregate-level and group differences in individual neighborhood outcomes. This study overcomes the issue by using new formulations of commonly used measures of segregation developed by Fossett (2014) that clarify how group differences in individual-level neighborhood outcomes exactly determine aggregate level segregation. In doing so, the analysis of segregation can begin

at the individual level, conducting the sort of analyses found in the residential attainments literature where the relationship between multiple social characteristics of individuals and segregation-relevant neighborhood outcomes can be analyzed using multivariate regression models.[2] The mean group-specific predictions on neighborhood outcomes based on these models can then be used to obtain the exact value of the aggregate-level segregation index score.

This method opens the door to a more comprehensive analysis of how micro-level social processes shape aggregate level segregation patterns in a precise quantitative way. In addition, it makes it possible to use standardization and decomposition techniques to quantitatively assess what the driving factors of segregation are. These techniques can answer questions such as "Which factors have the largest impact on overall differences in residential outcomes between Whites and Latinos?" and "Does equalizing Whites and Latinos on social and economic characteristics, thereby increasing social similarity and presumably reducing social distance, result in the equalization of residential outcomes and elimination of segregation?" The ability to explore these questions in a careful and systematic way increases our general understanding of the driving mechanisms of segregation and the separate impact that each mechanism has on overall neighborhood outcomes.

Using these methods, I will examine specific cities for in-depth, quantitative case study analyses of segregation patterns. In addition I will introduce a further innovation

[2] Segregation-relevant neighborhood outcomes (y) are scored on the basis of area ethnic mix (p) using index-specific scoring functions (i.e., $y = f(p)$) derived to yield index scores as a group difference of means on neighborhood outcomes (Fossett forthcoming).

by using standardization techniques at the micro-level in order to run macro-level models to analyze variation in segregation patterns across cities while controlling for varying factors (e.g., education, income, English language ability, nativity, etc.) at the individual level. This new method can be used to accomplish the same goal of traditional approaches to studying city-level variation in segregation; that is, it can exactly replicate results of aggregate-level regression analyses predicting segregation index scores for cities based on standard contextual variables such as city size, region, and ethnic composition. But the more significant innovation is that the method permits one to elaborate the models further and investigate the effects of contextual variables while appropriately controlling for micro-level city-specific variation. Many previous studies of the past have performed macro-level multi-city analysis of segregation but so far none have been able to appropriately control for the role of group differences in individual-level social characteristics. They have instead attempted to take account of these factors by constructing aggregate-level measures of group disparity on individual-level characteristics and including them as independent variables in city-level regression analyses. The motivation for pursuing this strategy is clear – it is obviously desirable to assess the role that group differences in individual-level characteristics play in shaping variation in segregation across cities. But, while well-intentioned and widely used, the strategy is inappropriate due to the fallacy of controlling for individual-level factors at the aggregate level. This particular issue is addressed and handled appropriately in this study using the new techniques overviewed here and described in more detail in later chapters.

In this study I also address the second limitation of data availability. In order to conduct a study where individual-level residential attainment models are used to investigate aggregate level segregation patterns, census microdata is needed. The term "microdata" refers to data that has not been aggregated but instead consists of fully-detailed individual and household records. These data are necessary because the units of analysis in residential attainment models are individuals (or households). However, the census microdata that is available publicly has two major drawbacks. The first is that the sample distributed to the public is significantly smaller than the full underlying sample, with the largest sample available being only 5 percent even though, for instance, the 2000 decennial census long-form collected data on nearly 17 percent of the population. For conducting detailed analyses of residential outcomes, a larger representative sample is always preferred, but a 5 percent sample is especially inadequate for some areas where the representation of the particular groups of interest is small.

The second drawback of the publicly available census microdata is a more central one for segregation research. In order to study the segregation patterns of neighborhoods, it is crucial that microdata contain geographic information comparable to what we think of as a neighborhood. In fact, without this information the study of neighborhood level segregation is impossible. However in the publicly distributed census microdata, the smallest level of geography available is the Public Use Microdata Area, or PUMA. One of the criteria for delineating PUMA boundaries is that the area must have a *minimum* population of 100,000. In comparison, a census block has a

population on average of 35 to 40. To put it simply, a PUMA is absolutely an inappropriate level of geography for studying neighborhood segregation. In fact, there are entire cities that do not meet the 100,000 minimum threshold for being a PUMA, and only the very largest metropolitan areas have as many as 20 or more PUMAs. For this and more reasons discussed later, using the public microdata or any version of the publicly distributed census data (including the summary files) for this study is undesirable and would complicate both the analyses and the interpretation of the results.

Both of the limitations regarding the public data can be overcome by accessing the restricted census microdata files available in the Research Data Center network. These files consist of the full person and household records including geographical information on residence down to the census block. The process for acquiring this data is lengthy and requires project approval from the US Census Bureau as a subsequent review for security clearance. Additionally, the tasks of accessing and analyzing the data must be performed in a secure federal facility known as a Research Data Center, where all data preparation and statistical analyses must be conducted on secure terminals connected to the main servers at the US Census Bureau. I received approval to use this data at the Texas Census Research Data Center at Texas A&M University, where I have full access to the 2000 and 2010 decennial census microdata as well as the microdata for the 2005-2015 American Community Surveys.

The most important advantages of these restricted data files are that the full samples are available (for example, the complete nearly 17 percent sample in 2000 is available in the restricted microdata files as opposed to the 5 percent sample available in

the public microdata files) and finer levels of geography are provided for both individuals and households. The geography component, to reiterate, is the most crucial element because it allows for the study of residential attainments and segregation at levels of geography comparable to neighborhoods such as the census block.

By adopting innovations that overcome the methodological and data limitations of previous research, I will perform the most detailed and comprehensive study of how White-Latino segregation varies over time and place. In this study I intend to first present case study analyses for a selection of six major metropolitan areas where micro-level residential attainments will be modeled and used to measure and analyze aggregate patterns of residential segregation. This component of the study will be presented as both substantive and methodological in nature. Regarding the methodological contribution, it provides an in-depth study of White-Latino segregation in major cities and showcases the new methodological innovations that can be used to help develop our understanding of how segregation is patterned by micro-level social processes of neighborhood attainments.

Following this, I will conduct standardization and components analyses for the same six cities, assessing the separate and joint impacts of differences in social characteristics and rates of return on overall patterns of segregation. Standardization and decomposition techniques, as described in more detail later, are extremely useful in this type of analysis because group differences in social characteristics can be controlled in order to capture how much segregation persists afterwards. The final step will be to conduct a nationwide multicity analysis in order to model variation in segregation

patterns across city. Here standardization techniques again become useful because differences in social characteristics across groups and across cities can be controlled at the individual level in order to capture only the city-level effects on the variation in segregation patterns.

This study will have a time component as well, covering the two decennial time points from 2000 to 2010. For the analysis of 2010, the 2008-2012 pooled American Community Survey microdata will be used for the individual-level samples and to construct independent variables that cannot be constructed using the decennial census (due to the fact that there is no longer a decennial census long-form after the 2000 census. There are multiple substantive and methodological reasons for choosing to look both at the 2000 and the 2010 data. Substantively, the dynamic nature of the Latino population justifies the need to document trends in their residential outcomes over time. Methodologically, the issues of moving from the much larger 2000 census long-form sample to the smaller pooled American Community Survey sample need to be addressed, particularly because the American Community Survey is and will continue to be the best option available after 2000.

These analyses serve multiple goals. Substantively, they will provide the first comprehensive study of White-Latino segregation that directly links micro-level social processes of residential attainments to overall patterns of segregation across areas and over time. This has never been done before in a precisely quantitative way, and so this study will make an important contribution to the literature by establishing a valuable new way of studying segregation. Another key benefit of the study is that it will inform

the theoretical frameworks researchers rely on for explaining and understanding racial and ethnic residential segregation. Specifically, the study will critically assess the theory of spatial assimilation, which states that over time as Latinos acquire English language skills, education, income, and citizenship, their residential contact with Whites will increase, to determine its empirical relevance for Latinos. Methodologically, these analyses will show the full potential of the new methodologies used in this study and also demonstrate how to move forward with using the smaller American Community Survey sample to conduct segregation research going forward for 2010 and beyond.

The chapters of this study are as follows: Chapter 2 will provide a demographic profile of the Latino population, an overview of the existing literature and previous research, and a discussion of the theoretical frameworks that structure and guide segregation research. Chapter 3 will describe the data sources, the formulas used to measure segregation, the variables in the analysis, and the methods of analysis. Chapter 4 is the first of the analysis chapters, presenting case studies on six selected cities which include multivariate models of residential attainments and overall segregation patterns. Chapter 5 is the second analysis chapter and will take the case studies one step further by conducting standardization and components analyses on the multivariate analyses in order to quantitatively assess the contributions that group differences in characteristics and rates of return make to overall White-Latino differences in residential outcomes. Chapter 6 is the final analysis chapter and will present results of a multi-city analysis that models cross-area variation in segregation patterns over a sample of large metropolitan areas while controlling for individual level differences in social

characteristics at the micro-level. Chapter 7 will then summarize the results in overview and draw final conclusions regarding substantive and methodological issues. This chapter will also review the limitations of the study and outline plans for future research in this area.

CHAPTER II

BACKGROUND, LITERATURE AND THEORY

Overview

In order to move forward with a more comprehensive analysis of Latino residential outcomes in the U.S., I will situate the analysis in a theoretical framework that guides model specification and interpretation of results. In the case of segregation, nearly a century of research and scholarship has produced a wealth of theories that inform our understanding of race-based residential patterns and mobility in the U.S. The most prominent of these theories are spatial assimilation and place stratification, both of which are relevant for analyses of Latino residential segregation. These two theoretical frameworks are well-established in the literature. The origins of spatial assimilation theory trace back to the Chicago School and the work of Park and Burgess in their studies of the residential patterns of White ethnics in the 1920s. In recent decades it has been further refined and extended by Lieberson (1980), Alba and Logan (1992, 1993), Massey (1985), Massey and Denton (1987) and many others. The term "place stratification" originates with Logan (1978), but its emphasis on the role of discrimination in producing racial segregation draws on a voluminous literature on housing discrimination that extends back at least to the many studies of the emergence of White-Black segregation and ghetto formation in northern and midwestern cities during the time of the Great Migration.

The task that I undertake in this this chapter is to review both of these major theoretical frameworks and discuss their specific relevance for explaining Latino residential outcomes. In addition, supplementary theories such as hypotheses regarding the roles of segmented assimilation, immigrant congregation and enclave formation, ethnic preferences, and other factors will also be discussed as they address certain aspects of residential patterns that are particularly relevant for the Latino population in relation to Whites. Before delving into these more focused theoretical perspectives, it is important to first review the demographic trends and historical events that have contributed to changing residential patterns. The subject of demographic change is one that is especially important for the Latino population as in recent decades they have been and continue to be the most dynamic population in the US in terms of their growth and movement. Once these general factors relevant to contemporary patterns of segregation have been reviewed, the groundwork will be set for spatial assimilation theory, the primary framework for this study, followed by place stratification. At the conclusion of this chapter, the motivations for variable choices, model specification, and other methodological decisions outlined in Chapter III will be clear.

Definitions

It is important at this point that I define the dimensions of segregation, as an understanding of the various ways that segregation is defined is necessary in order to discuss trends, empirical findings and theoretical perspectives. In their influential and widely cited 1988 work, "The Dimensions of Residential Segregation," Douglas Massey and Nancy Denton identify five dimensions that together make up the complex, multi-

dimensional contemporary conceptualization of residential segregation. The first of these and the most widely studied of the five is evenness. Evenness is "the degree to which the percentage of minority members within residential areas equals the citywide minority percentage; as areas depart from the ideal of evenness, segregation increases" (Massey and Denton 1989:373). Essentially, evenness refers to the distribution of a group across neighborhoods in comparison to the proportion of that group at the city level (Massey and Denton 1988). When a group is evenly distributed, every neighborhood should have the same proportion of that group as the city overall does. If the minority group is not evenly distributed across all neighborhoods, that implies that there are other factors at work that are causing some level of segregation (Blau 1977). In this study as in many others, evenness is the dimension that will be analyzed.

The other four major dimensions of segregation identified by Massey and Denton are clustering, concentration, centralization and exposure. Clustering is the pattern where a minority group in a city inhabits multiple adjacent areas, as in the case of an ethnic enclave or ghetto. Concentration refers to the relative size of the residential space that the minority group occupies and centralization is "the degree to which a group is spatially located near the center of an urban area" (Massey and Denton 1988:291). Exposure is the second most studied dimension of segregation because of its socially meaningful outcomes in relation to the potential for interaction with members of other groups. Exposure is the amount of potential physical contact that two groups can have with one another based on their residential patterns (Massey and Denton 1988). This dimension is studied indirectly in the present analysis and in addition several of the

studies reviewed below do involve analyses of exposure and isolation.[3] When a group is found to experience all five dimensions at high levels, it is known as "hypersegregation" (Massey and Denton 1989).

Residential Segregation Trends and Demographic Drivers

The origins of segregation research are deeply entrenched in the origins of American sociology dating back to the Chicago School of the 1920s and the reign of classical human ecology, when researchers associated with the University of Chicago began to observe and study the spatial dimensions of Chicago's ethnically and socioeconomically diverse population with attention directed at White ethnic groups. The social landscape during the late 19th and early 20th centuries was transformed dramatically by European immigration, which occurred in response to booming economic development in the United States. Massey (1985) notes that from 1842 up until the Civil War, immigration from northwestern Europe added nearly 4.2 million people to the U.S. population with much of it concentrated in the major cities of the era, especially along the eastern seaboard (e.g., New York, Philadelphia, Boston, etc.). Following this initial wave, a second, larger wave occurred during the latter decades of the nineteenth century which resulted in approximately 26.3 million new immigrants, this time from Southern, Eastern and Central Europe. It also was concentrated in major cities including the emerging inland cities of the midwest (e.g., Chicago, Cincinnati, Cleveland, Pittsburg, Saint Louis, etc.) as well as traditional eastern sites of immigrant

[3] The analysis in this study examines White and Latino differences in contact with Whites with the distinction that the focus is on "pairwise" contact – based just on the residential distributions of Whites and Latinos – instead of overall contact which is based on all groups.

entry. This stream of Southern and Eastern European immigration was cut off by the Immigration Act of 1924. By this time most major cities of the U.S. had become completely diversified by a variety of European ethnic groups who had formed their own communities in a new world.

However, around the same time that immigration from Europe was subsiding, a new wave of migration was only just beginning; large numbers of Black migrants from the South moved north in response to labor opportunities as part of the migration wave known as the "Great Migration." Its impact resulted in a sudden swell in the Black population in those same northern and midwestern cities such as New York, Chicago, Philadelpia, Boston, Detroit, Cincinnati, and others whose growth previously was being demographically driven by European immigration. The consequence for residential patterns in these cities was that as White ethnic groups became less segregated from one another, a racially charged response to Black in-migration caused Whites of all ethnic groups to residentially separate themselves from the Black arrivals. This was done through a variety of means including but not limited to avoidance of Black neighborhoods, open hostility towards Black in-movers, racial housing codes and restrictive covenants that enforced restrictions on who could live in which neighborhoods, discriminatory practices in the housing and lending markets, and informal discrimination often including acts of intimidation and violence directed toward Blacks (Lieberson 1981; Massey and Denton 1993). The result was that in many of these cities Blacks came to be hypersegregated; that is, Blacks experienced high levels of segregation on all five primary dimensions of segregation. These residential patterns

were further reinforced and exacerbated by the emergence of public housing that concentrated low-income Black families into neglected neighborhoods (Rosenbaum 1996).

Following this period of rapid growth in the Black population and severe resistance on the part of Whites to share neighborhoods with the new arrivals, the Civil Rights era culminated in major legislation being enacted including, of particular relevance to racial residential segregation, the Fair Housing Act of 1968. The legislation prohibited discriminatory practices in the housing and lending markets based on race or ethnicity and an administration apparatus was put into place to enforce these laws. Initially, enforcement activity was hampered due to poor funding and limited legal tools. But the capabilities were enhanced by follow up legislation in the Fair Housing Act of 1988, which sought to address these limitations (Schill and Friedman 1999). The law had its most impact on newly developing metropolitan areas, mostly in the Western region of the U.S. where cities were growing rapidly, often leading to neighborhood destabilization and change, and where extensive construction of new neighborhoods in the post-Civil Rights era could not overtly restrict minorities from participating in the tide of residential expansion. This along with a lessening of expressed prejudices and discriminatory behaviors against Blacks and a rising Black middle class are attributed to the observed decline in Black segregation during the latter half of the 20th century (Farley and Frey 1994; Iceland et al. 2002; Massey and Denton 1987).

Thus far there has been no mention of Latinos, but this is because segregation research up until the late 20th century focused almost exclusively on White ethnics and

then Blacks, partially due to the fact that Latinos did not start significantly impacting the demography of the U.S. until after major legislation was passed in 1965 which opened the gateways for Latin American and Asian immigration. Since the Immigration Act of 1965, the Latino population has grown tremendously in size due both to immigration and natural growth, having a relatively younger age structure and higher fertility rates compared to other racial-ethnic groups (Saenz 2010). Today Latinos are the largest ethnic minority group in the U.S. and have moved researchers to call for more work to be done on the social outcomes of Latinos, including in the area of residential segregation (Charles 2003; Clark 2002; Fischer and Tienda 2006; Iceland and Nelson 2008; Rosenbaum 1996; Saenz 2010).

Latinos as a panethnic population have a deeply rooted presence in the United States, with the Mexican-origin population in particular tracing their history in the country back to a time predating United States incorporation and governance of the Southwestern region where the Mexican-origin population still predominately resides. As of the 2010 decennial census, Latinos of all races and nationalities comprise over 16 percent of the total U.S. population, up from 12.5 percent in 2000. The largest share of this population are of Mexican origin (at 58.5 percent), who vary from being recent immigrants to people who are several generations removed from immigration or whose ancestral families resided in areas that were claimed by the U.S. after the Treaty of Guadalupe Hidalgo in 1848 that ended the Mexican-American war. The second largest group in the Latino population consists of those who are of Puerto Rican descent (9.6

percent), followed by Cubans (3.5 percent) with the remainder being of various countries in the Caribbean, Central America and South America (U.S. Census Bureau 2010).

As Saenz (2010) and others have noted, the Latino population is highly diverse due to both historical origins and immigration trends, so that today there is a vast range of language usage and ability, ethnic identifications, racial identifications, levels of socioeconomic status, and national origin. In general, foreign-born Latinos are less educated, have lower levels of income, and are less likely to speak English in comparison to native-born Latinos (Saenz 2010). This fact is especially significant because nearly 40 percent of the Latino population is foreign-born (American Community Survey 5-year Estimates 2012). The implications for Latino residential outcomes is that we may expect to see a wide dispersion of residential outcomes based on levels of socioeconomic status and cultural distance from non-Latino Whites. In addition, while discussions of White-Black segregation are fairly simplified by the fact that the minority population in question is of only one racial identification, Latinos are very racially diverse with some populations, such as Puerto Ricans and Dominicans, identifying as Black and finding themselves experiencing the same sort of social outcomes as non-Latino Blacks and many other Latinos identifying as "Some other race" (Rosenbaum 1996; U.S. Census Bureau 2010).

These unique aspects of the Latino population and how they affect residential outcomes are reflected in the theoretical perspectives reviewed below, but in discussing the national level trends of Latino residential segregation, much of the focus is on how population growth, and especially the role of immigration, plays a role in the changes in

Latino segregation over time (Charles 2003; Massey 2001; Massey and Denton 1987). The general finding is that Latino segregation has stayed stable or has slightly increased since 1980 on the dimension of evenness, while the residential isolation of Latinos has markedly increased during the same time frame (Charles 2003; Iceland et al. 2014; Iceland et al. 2002). Both of these trends have been attributed to population growth in one way or another, and the theoretical explanations for why this is so are based in ideas of immigrant settlement and community (Massey and Denton 1987).

To elaborate, the general consensus in the literature is that Latinos' decreased exposure to Whites is due at least in part to changing ethnic composition in metropolitan areas. The Latino population continues to grow in traditional gateway areas such as the Southwestern region, and is growing even more rapidly in areas of the South and Midwest where Latinos are migrating to in response to labor demands (known as "new destinations"). The logical result is that Latinos have more contact with each other and a lessening amount of contact with Whites (Charles 2003; Iceland 2004; Iceland et al. 2014; Iceland et al. 2002; Massey 2001; Massey and Denton 1987). The explanation for why the level of uneven distribution of Latinos is remaining stable and even rising is less clear but may also be explained by population growth and patterns in initial settlement of immigrant and migrant Latinos. This idea will be explored further below.

In terms of where Latinos stand compared to other racial and ethnic groups in the U.S., the consistent findings in the literature show that Latinos are less segregated from Whites than Blacks are, but more segregated than Asians (Charles 2003; Iceland 2004; Iceland et al. 2002; Iceland et al. 2014; Zubrinsky and Bobo 1996). There is a nuance

here, which is that when Black Latinos are observed separately, they experience levels of segregation more similar to non-Latino Blacks which demonstrates the continuing saliency of Black identity and the "one-drop rule," as well as the consequences of holding a double minority status (Denton and Massey 1989; Rosenbaum 1996; Scopilliti and Iceland 2008). This is reflected in the finding that Latino segregation is highest in Northeastern cities such as New York City where a larger proportion of the Latino population is of Puerto Rican or Dominican descent and racially identifies as Black. Nonetheless, while in many areas non-Latino Blacks are found to be hypersegregated, there are no observed instances of non-Black Latinos experiencing hypersegregation (Massey and Denton 1989).

These descriptive findings about the general trends of Latino segregation, alone and in comparison to other racial and ethnic groups, provide some idea of the level of integration that Latinos experience in the U.S. This is a necessary foundation but the micro-level dynamics that produce these outcomes must be understood in order to get from merely an aggregate-level descriptive analysis to theoretically driven analyses of Latino residential outcomes and what factors influence them. Fortunately, past research in the area has already developed theoretical frameworks that prove to be useful in explaining the drivers of racial residential segregation. The two strongest and most commonly applied frameworks, as mentioned previously, are spatial assimilation and place stratification. Beyond these two are several smaller and more limited theoretical perspectives that serve to explain how we may observe outcomes that deviate from the patterns predicted by spatial assimilation and place stratification. Below I review spatial

assimilation and place stratification, which are both relevant to the present study, and also briefly discuss supplementary perspectives that have found some support in past studies.

Spatial Assimilation Theory

Spatial assimilation theory is advances the hypothesis that with increased socioeconomic mobility and acculturation, members of a minority group experience residential mobility, typically defined as living in neighborhoods with a higher proportion of Whites or as dispersing to suburban areas (Alba and Logan 1991; Charles 2003; Duncan and Lieberson 1959; Massey 1985). It is further argued that residential mobility is one more step towards full integration into U.S. society, alluding to a more general process of assimilation and incorporation (Massey and Mullen 1984). The origins of this theory on assimilation and residential mobility date back to the 1920s, emerging from the Chicago School and in particular out of the work of Park and Burgess and their many students at the University of Chicago who conducted research on segregation and neighborhood change in Chicago during a time when immigration was driving the city's rapid growth and a significant percentage of the city's population was foreign-born. With rising concerns about how these immigrant groups would be able to incorporate themselves into American society, these prominent researchers of the Chicago school paid particular attention to residential patterns as a visible indicator of social separation between the different immigrant groups from each other and from the native-born.

In the landmark work by Park and Burgess, *The City* (1925), Burgess outlines a pattern of outward radial expansion approximating a series of concentric zones emanating from the central city of Chicago. The innermost residential zone of the city is located adjacent to industrial and commercial areas and has older housing stock and is inhabited by recent immigrants in less desirable neighborhoods close to low-wage labor opportunities in nearby factories. Each zone extending outward has newer, more desirable housing stock and is inhabited by generations removed from immigration who are more socioeconomically and culturally similar to the third-generation population that is native-born of native-born parents. What Burgess observed is now known as spatial assimilation, a term made popular in the 1980s work of Douglas Massey (1985). While the early work of the Chicago School had several flaws, this basic idea about neighborhood mobility that Burgess proposed based on his observations of the 1920s ethnic groups in Chicago laid the foundation for understanding residential attainments and patterns.

To restate the point, the key idea of spatial assimilation is that with social mobility comes residential mobility. In general, this means that gains in socioeconomic status result in access and movement to more desirable neighborhoods and higher status groups. There has been strong support for the spatial assimilation model in the literature, especially in the case of European ethnic groups for whom immigration and nativity played a major role in shaping minority ethnic status. Contemporary research has consistently reported findings supporting the view that spatial assimilation theory has considerable relevance for explaining the residential outcomes of Latinos and Asians

(Alba and Logan 1993; Charles 2003; Iceland et al. 2014; Iceland and Nelson 2008; Iceland and Scopilliti 2008; Massey 1985; Massey and Denton 1985; Yu and Myers 2007). For example, studies consistently show that, over time and across generations, Latinos can and do experience residential mobility and increased contact with Whites. However, this is an oversimplification of the story because, as has been pointed out already, Latinos are not a homogenous group with uniform outcomes but rather are racially and culturally diverse with residential patterns varying significantly across subgroups within the Latino population. In particular, past research has devoted a great deal of discussion to how immigration plays a role in the trajectory of residential outcomes for Latinos.

The definitive work of Massey (1985) discusses the concept of spatial assimilation within the context of immigration, arguing that at first immigration causes a succession process where the neighborhoods that immigrants inhabit are abandoned by native-born Whites and ethnic concentration emerges. Then, once immigration stops, the process of spatial assimilation accelerates and residential mobility occurs as the "social distance" between members of the ethnic groups and native-born Whites decreases. This idea is based on the observed outcomes of White European ethnic groups in the early 20th century, but as Massey points out, "…the newest Hispanic immigrants display patterns of succession and assimilation remarkably similar to those of their predecessors" (1985: 328).

The role of immigration in spatial assimilation dynamics was reviewed extensively by Duncan and Lieberson (1959) and Lieberson (1980). Duncan and

Lieberson (1959) found a clear inverse correlation between measures of assimilation and levels of segregation, in addition to an inverse correlation between measures of assimilation and the centralization of White ethnic groups. In a more in-depth study of European immigrants in comparison to Blacks in the early 1900s, Lieberson found in his 1980 book, *A Piece of the Pie: Blacks and White Immigrants Since 1880*, that while the segregation of White ethnics was at one point similar to or even greater than Black segregation in Northern cities, it declined substantially following the cessation of large scale European immigration first occurring with the onset of World War I and then made permanent by the Immigration Act of 1924. Lieberson (1980) suggested that the initially high levels of European immigrant segregation was in part due to choice and adaptive ethnic congregation as immigrant groups formed enclaves that reproduced home-country ethnic institutions and facilitated adjustment to new lives in the U.S.. But segregation declined for later generations of these groups as acculturation and socioeconomic assimilation reduced the benefits and attraction of these enclaves as the process of spatial assimilation began. Crucial to this process, these new European ethnic groups, while experiencing high levels of prejudice, ethnic antagonism, and discrimination around their times of peak immigration when groups were heavily first generation and most culturally and socioeconomically distinct from established White groups, experienced lower levels of prejudice and discrimination as their population composition shifted steadily away from foreign-born status and toward second- and third-generation status (Lieberson 1981; Massey and Denton 1993). Relatedly, European ethnic groups, in

contrast to Blacks, escaped being classified as Non-White and thus were never subject to institutionalized discrimination based on racial status.

While European immigration is no longer consequential enough to warrant any large amounts of attention, Latino and Asian immigration has influenced the spatial distribution of the U.S. population in tremendous ways since the 1960s and the spatial assimilation perspective is still very relevant for these contemporary trends. This is highlighted by the earlier work of Alba and Logan (1993) and more recent work by Alba and Nee (2003), Iceland and Nelson (2008) and Iceland and Scopilliti (2008). In their influential book *Remaking the American Mainstream* (2003), Richard Alba and Victor Nee take classic perspectives on assimilation and reevaluate them in the context of recent immigration patterns which are now driven by arrivals from Latin American and Asian countries rather than European countries. One aspect of that is, of course, reassessing assimilation on a spatial dimension.

The authors concur that, just as the European groups of the early 20th century initially experienced dimensions of segregation such as isolation and concentration but eventually and across generations dispersed from ethnic enclaves and ghettos, Latino and Asian groups are in some ways following the same trajectory. The main difference is only that there is less initial settlement in inner-city areas and more immediate settlement in suburbs, which should not be entirely surprising given that modernized modes of transportation have made life in the suburbs more efficient than before and that a large percentage of Latinos and Asians are residing in the Western region of the U.S. where cities experienced a great deal of post-World War II development and therefore

have more suburban sprawl. However, several contemporary studies have agreed upon the idea that segregation is initially high for immigrant groups due in part to the desire to at first reside in ethnically homogenous communities where social support and ethnic-based/ethnic-serving community institutions (e.g., Spanish-language churches, newspapers, markets, immigrant legal services, wire services, etc.) can be found to assist in settlement and adaptation to urban life in the U.S., especially for those of lesser education and skills who are seeking out labor, or those whose household include individuals with uncertain or complicated legal status or who experience a language barrier to succeeding in the predominately English-speaking market (Clark 2002; Hall and Stringfield 2014; Iceland et al. 2014; Iceland and Nelson 2008; Iceland and Scopilliti 2008; Lichter et al. 2010; Massey 1985; Yu and Meyers 2007; Zubrinsky and Bobo 1996). This part of the process is further explored later in this chapter, in the discussion of the strategy of adaptive ethnic congregation and the role of preferences for certain types of neighborhoods based on racial and ethnic composition.

With regards to the variables that are considered in spatial assimilation models, earlier work by Massey (1985), Massey and Denton (1987), and Alba and Logan (1991; 1992; 1993) emphasize socioeconomic status and acculturation as primary factors. Socioeconomic status includes education, income, occupational prestige, and homeownership, while acculturation refers to time spent in the U.S., English language acquisition and naturalization. There is also a generational component as residential mobility operates across generations removed from immigration. The role of English language ability in the context of spatial assimilation is especially given a great deal of

attention, as it can serve as a major barrier to breaking into certain housing markets dominated by native-born non-Latino Whites. Overall, however, studies have found positive relationships between socioeconomic gains and acculturation with residential mobility whether it is defined as suburbanization or residential contact with Whites (Alba and Logan 1991, 1992, 1993; Massey and Denton 1987; Yu and Myers 2007).

It is important to note that while Latinos and Asians have both been observed to experience a path of spatial assimilation, this framework has not been relevant for explaining residential outcomes for Blacks. Despite being predominately native-born and English-speaking, Blacks continue to be the most highly segregated minority group in the U.S. and gains in socioeconomic status do little to reduce residential separation from Whites (Massey and Denton 1987). Taeuber and Taeuber (1964) suggested the history of slavery and Jim Crow segregation in the American South might warrant viewing Black residing outside the South following the Great Migration as an immigrant group. But White-Black segregation crystallized at extremely high levels in Northern and Midwestern cities from 1910-1930 and remained at high levels for many generations continuing to this day. This issue extends to the case of Black Latinos, who have been found to experience a lesser degree of spatial assimilation as compared to White Latinos (Alba and Logan 1993; Denton and Massey 1989; Iceland and Nelson 2008). This is where the spatial assimilation perspective approaches its limitations as it cannot account for the persistent role of race in blocking the way to residential equality, not just for non-Latino Blacks but for Latinos who also identify racially as Black such as many Puerto

Ricans, Dominicans, and to a lesser extent Cubans. The next theoretical framework to be discussed in this chapter, place stratification, will help address that issue.

To conclude, the final point to be made about spatial assimilation theory is that research spanning many decades has lent support for using this framework to understand Latino residential segregation, particularly Latino segregation from Whites. The relationship between social mobility and residential mobility is strong for Latinos and has been observed repeatedly. Therefore this framework will provide the primary guidance for the research design of the analyses conducted in this study. However, it is important to note that while Latinos are inarguably experiencing some level of spatial assimilation, overall segregation between Latinos and Whites is persisting over time. It might be possible to argue that this is due to a large percentage of foreign-born individuals in the Latino population, as many supporters of spatial assimilation theory have suggested, and that perhaps over time as immigration from Latin America continues to dwindle segregation will recede as it did for White ethnics in the early 20th century. But there is another explanation for why segregation may continue despite Latino acculturation and gains in socioeconomic status that would otherwise predict a reduction in social distance to Whites and subsequent increase in residential contact with Whites. This is where the place stratification perspective enters into the discussion.

Place Stratification

The place stratification perspective is sometimes perceived to be a counter-theory to spatial assimilation, but in fact the two are not necessarily mutually exclusive and place stratification can also be a complementary theory that can serve to explain

residential dynamics where spatial assimilation stops short (Alba and Logan 1991; Charles 2003). Place stratification essentially addresses the role of race-based discrimination in determining residential patterns and therefore is a theory of discrimination that is placed specifically within the context of how it produces racial residential segregation, with the key explanatory variable being race. The conclusions made by place stratification theory is that racial prejudices and perceptions of a racial hierarchy and advantage that the majority feels must be maintained result in Whites keeping minority group members out of their neighborhoods through housing market discrimination and avoidance of predominately non-White neighborhoods. As Logan (1978) theorized, the act of restricting minorities to certain neighborhoods in part serves to maintain an order in which the White majority group is advantaged and stands at the top.

A substantial literature exists which has explored in depth how the social mobility of minorities via gains in socioeconomic status and acculturation may not necessarily lead to integration with Whites due to race-based factors that include the discriminatory actions of the housing market and White residents as well as the reluctance on the part of minorities to live among Whites for fear of facing hostility. Despite major legislation being passed which outlawed race-based housing discrimination, studies to this day still find that discriminatory practices persist which block minorities from entering White neighborhoods. More insidiously, White avoidance of minority neighborhoods due to racial prejudice cannot be addressed by laws and is difficult to pinpoint, but still plays a major role in keeping neighborhoods segregated

(Ellen 2000). The majority of this work has revealed that the groups whose residential outcomes are most affected by discrimination are those who racially identify as Black, both Latino and non-Latino (Alba and Logan 1992, 1993; Bobo and Zubrinsky 1996; Charles 2003; Denton and Massey 1989; Emerson et al. 2001; Farley and Frey 1994; Farley et al. 1994; Farley et al. 1997; Galster 1990; Harris 1999; Iceland et al. 2014; Iceland and Nelson 2008; Jackman 1977; Krysan 2002; Krysan and Farley 2002; Massey and Denton 1987; Massey and Lundy 2001; Rosenbaum 1996; Yinger 1998; Zubrinsky and Bobo 1996).

Support for the place stratification perspective comes from a variety of studies using both secondary data analysis as well as audit studies. Studies that have relied on secondary data have found evidence of race-based discrimination by comparing multiple groups and finding that gains in socioeconomic status and acculturation do not provide returns on residential outcomes equally across all racial and ethnic groups. While Asians and to a lesser degree non-Black Latinos experience substantial residential mobility with gains in socioeconomic status and acculturation, non-Latino Blacks and Latino Blacks do not receive the same level of returns and there is no support for an economic explanation as to why this is so, leaving the strong possibility that the U.S. history of uniquely severe racial prejudice and discrimination against Blacks is to blame (Bobo and Zubrinsky 1996; Denton and Massey 1988; Rosenbaum 1996; Zubrinsky and Bobo 1996).

Audit studies are one of the most effective ways at exploring the theory that segregation is in part due to discriminatory behaviors, particularly in the housing market

(Turner 1992). For instance, Galster (1990) found that Latinos received less helpful information from agents regarding neighborhoods in comparison to Whites. Massey and Lundy (2001) found that spoken accents perceived as belonging to a Black prospective homebuyer resulted in a lower likelihood of receiving an appointment to see units in predominately White neighborhoods, a finding consistent with previous work by done by Purnell and colleagues (1999) who also found this to be true of people who spoke with a Chicano accent. Housing audit studies continue to reveal the role of discrimination in residential sorting and how that is changing over time, with more recent work by Turner and colleagues (2005) showing that while discriminatory practices are on the decline, they still happen at a concerning level.

To summarize, place stratification looks to the race-based factors both attitudinal and structural that can hinder minority residential contact with Whites and prevent integration. Individual attitudinal factors include unwillingness on the part of Whites to enter neighborhoods where there is a significant minority presence (Ellen 2000) and hostile reactions towards pioneering minority group members into predominately White neighborhoods (Krysan and Farley 2002; Charles 2003) . Structural factors involve discriminatory policies, public housing development in low quality neighborhoods, lending discrimination, and neighborhood steering. While discriminatory policies in real estate and lending have been outlawed, research provides evidence that there are still structural barriers to minority residence in White neighborhoods such as continuing lending discrimination and steering which are especially detrimental to non-Latino Blacks and Latinos who racially identify as Black (Denton and Massey 1989).

Therefore, while spatial assimilation theory focuses on the social mobility of minority group members and their potential for residential mobility, place stratification addresses the fact that race itself still serves as a barrier to full integration due to continuing problems with discrimination and prejudiced attitudes.

For the present study, the place stratification framework will be instrumental in explaining how White-Latino segregation may still persist even after Latinos have in all important ways made social gains that would put them on comparable standing with Whites, including gains in income, education, English language ability, and citizenship. The fact of the matter is, while some Latinos experience only low hurdles towards integration, others, especially Black Latinos, are subjected to an additional and much more difficult hurdle that has been set up by ongoing race-based discrimination which is deeply rooted in the housing market and individual behaviors during neighborhood formation.

Thus far the two major theoretical frameworks that are instrumental to the present study have been reviewed, but smaller theoretical perspectives that are more limited in scope also warrant some attention due to their relevancy for studying the Latino population and how they may offer alternative or supplemental explanations for Latino residential outcomes apart from what the spatial assimilation and place stratification perspectives would suggest. To emphasize, however, interpretations of the results presented in this study will be largely within the context of the spatial assimilation and place stratification perspectives as they have the strongest amount of support in the literature.

Alternative Theoretical Perspectives

The first and the most popular of the alternative perspectives is segmented assimilation theory, which can perhaps be seen as a blend between spatial assimilation and place stratification. The theory posits, among other things, that there are divergent paths for the second generation (i.e. the children of immigrants) based on socioeconomic status, English ability and race (Portes and Zhou 1993; Zhou 1997). For the children of White immigrants, including White Latino immigrants, chances for upward mobility are great and integration into U.S.-born non-Latino White society is possible, especially for those who come from socioeconomically affluent immigrant backgrounds. This pattern would be consistent with the spatial assimilation perspective in that segmented assimilation theory expects that White Latinos will experience residential mobility with gains in socioeconomic status and acculturation and across generations. However, race plays a central role in segmented assimilation theory, because the other expectation within this perspective is that non-White Latinos will experience outcomes that are much more in line with the place stratification perspective. What this perspective posits is that while some Latinos who racially identify as White and are phenotypically similar to non-Latino Whites have opportunities for upward mobility, non-White Latinos face a barrier based on race that instead sends them into outcomes of disadvantage within the labor market as well as the housing market.

This theoretical perspective has its value in addressing the fact that Latinos, while treated as a single population, are racially and ethnically very diverse. It is worthwhile to acknowledge this fact because previous literature has indeed found that

Black Latinos do not experience the same levels of mobility as White Latinos. However, segmented assimilation theory in this study cannot contribute much more than what can already be understood by simply considering both spatial assimilation and place stratification in tandem. This is in part due to the fact that generational status does not factor into this study due to data limitations, and so the conclusions that segmented assimilation offers regarding the second generation cannot be applied. However, this theoretical perspective has been mentioned in previous studies of residential segregation and therefore it is customary to at least acknowledge it as an alternative take on the variation in Latino residential outcomes (Iceland and Nelson 2008).

A second perspective that is relevant to the Latino population can be known as the immigrant congregation perspective. This perspective posits that upon initial arrival, immigrants gravitate towards co-ethnic communities where they can receive the social support that they need to get settled and enter the labor market. There could be a substantial benefit to living at first among co-ethnics where language barriers are less of an issue, where social support and community eases the transition, and where labor opportunities might be greater. This can be thought of as an "adaptive ethnic congregation" mechanism, where segregation of a population with a recent immigrant presence is partially driven by the need for social support amongst co-ethnics while adapting. Beyond providing labor opportunities and social support, these co-ethnic communities can provide additional institutional resources based within the language of the community (i.e. Spanish) such as religious organizations, financial services, and news outlets (Breton 1964). However, whether the need for these communities sustains

over generations and as Latinos adjust and make socioeconomic gains is questionable due to the observations made since the studies of the Chicago School that as European immigration desisted, White ethnics became less reliant on co-ethnic environments. Later generations removed from immigration who are raised in the U.S. school system and are therefore predominately English-speaking and acculturated may find that they do not need the support of co-ethnic communities and move out of them upon reaching adulthood.

The third alternative perspective is sometimes known as the preferences hypothesis (Farley et al 1997) and considers the role that individual preferences about neighborhood ethnic composition play in neighborhood sorting patterns. This body of literature consists largely of a debate between two sides of the same coin, with some arguing that preferences rooted in the desire to live with co-ethnics are responsible for segregation while others argue that it is specifically preferences that involve avoiding some groups over others that is to blame (Zubrinsky and Bobo 1996). The first side is spearheaded by the work of William A.V. Clark who has long emphasized the power of ethnocentric desires to live in neighborhoods where an individual or household's racial or ethnic group is substantially present (Clark 2002, 1992). In his work he argues that the role of discrimination, both institutionally and on an individual level basis, has diminished to the point that now own-group preferences are playing a larger role in segregation patterns (Clark 1992). Based on his findings on the preferences of Whites as well as Latinos, Blacks and Asians, he has made strong statements in his work for in-group preferences, stating, "This basic ethnocentrism, whether white or ethnic, is a

fundamental force which will influence behavior in choices including residential patterns" (Clark 2002: 245).

While the findings of Clark have to some extent been observed by others (Bobo and Zubrinsky 1996; Zubrinsky and Bobo 1996), the other side of the debate leans more heavily towards the role of discrimination over in-group preferences. The central point of this side of the argument is that the stated preferences of Whites, Blacks, Latinos and Asians are not based on neutral desires to live amongst their own but rather are based on a rank ordering of types of neighborhoods where often times predominately Black neighborhoods are avoided by all, but are especially avoided by Whites. These rank-order preferences, which are also acknowledged in Clark's work (2002), are attributed in large part to ongoing discrimination and prejudiced attitudes by others (Emerson et al. 2001; Farley et al. 1997; Farley et al. 1999; Krysan and Farley 2002). In addition, some have found that all groups equally desire to live in the same kinds of neighborhoods, arguing strongly against in-group preferences being the main driver of segregation. All groups to some extent desire to live with Whites, though up to a certain point minority groups express less desire to do so when it means that they would be pioneers in predominately White neighborhoods (Zubrinsky and Bobo 1996). However, as Fossett (2006) has found based in his simulation work, if in-group preferences amongst minority groups exist, it will produce segregation. Thus even though in-group preferences may not be the main driver of segregation, it does contribute and so preferences theory has a legitimate basis for offering explanations as to why segregation occurs and persists.

There is a third response to this debate on preferences which is that preferences are actually due to a desire to live in economically affluent neighborhoods and avoid neighborhoods that are deemed unsafe or of lower quality. This is known as the racial proxy hypothesis and is showcased in the work of Harris (2001, 1999). Less discussion is given to this hypothesis and it is difficult to pinpoint the role of economic preferences in residential patterns using existing data, and so this hypothesis is merely worth nothing but is not the guiding framework for the present study. The preferences hypothesis has some qualities that could provide useful guidance in understanding the residential outcomes of Latinos but does not provide a complete picture and it is difficult to address the questions put forth by this theory using secondary population data. This study has no way of analyzing the role of preferences and so these questions are simply put forth for consideration and speculation.

Summary

To summarize, the two main theoretical perspectives that receive the most attention in the literature and will be further considered in this study are spatial assimilation theory and place stratification theory. These two perspectives complement one another despite seeming at odds with regards to predicted outcomes. Spatial assimilation theory posits that socioeconomic gains and acculturation result in residential mobility. In the context of Latinos, gains in income, education, English language ability, and the acquisition of citizenship are associated with greater residential contact with Whites. Increased residential contact with Whites is thought of as residential mobility

because predominately White neighborhoods tend to be more economically advantaged, receive more resources, and have less crime.

Past research has observed that Latino residential outcomes in general tend to be better explained by spatial assimilation theory. Place stratification, in contrast, addresses the role of racial discrimination that can hinder the spatial assimilation trajectory and provide an interpretation for why Latino segregation from Whites is persistent even in cities where Latinos have lived for quite some time. This perspective is particularly important for understanding the outcomes of Black Latinos in comparison to White and other race Latinos. Other theoretical perspectives offer alternative but limited interpretations of Latino residential outcomes and will not guide the analyses presented in this study. However, they are worth considering and revisiting in future studies, particularly the concept of immigrant ethnic congregation.

With these theoretical perspectives placed within the Latino context, the following hypotheses are put forth which have been explored previously and will be addressed again in this study but with new methods which will be described in the next chapter:

> **H_1: The Spatial Assimilation Hypothesis:** With gains in socioeconomic status (i.e. income, education) and acculturation (i.e. English language ability, citizenship), Latinos will experience more residential contact with the racial majority group, Whites.
>
> **H_2: The Place Stratification Hypothesis:** Due to a persistent race factor that hinders the path to completely even distribution, Latinos will not equalize with Whites on residential outcomes despite equalizing on social characteristics with Whites.

CHAPTER III

DATA AND METHODOLOGY

Overview

Two aspects of this study that make it unique are the data source and the method of analysis that is implemented. The data in this study are drawn from the restricted-use census microdata files, which require special permission from the U.S. Census Bureau in order to be used. Very few studies of residential segregation have drawn on the restricted-use census microdata files, and the few that have so far have not used the capabilities of these data to their full potential. The reason for this is methodological in nature: commonly used measures and methods for analyzing segregation have not previously called for the use of restricted census files because they were formulated at a time when calculations that required minimal computing power were preferred. Accordingly, index calculation and methods of analysis were adopted and optimized for using publicly distributed summary files tabulations prepared and distributed by the U. S. Census Bureau. However, the analyses conducted in this study use methodological innovations that are only possible with the use of the restricted census microdata files and the analyses reported in this study are the first of their kind ever to be conducted.

There are many reasons why prior research on segregation has relied on relatively crude summary file tabulations instead of detailed microdata. Not the least of these reasons is that the process of gaining approval to use restricted micro data files and then subsequently performing analysis requires substantial investments of time and

resources. More specifically, the project required a formal application to the Center for Economic Studies (CES) to gain approval to use the restricted microdata. The CES application process is non-trivial, taking two months of work with the TXCRDC RDC Administrator to prepare, additional time for revisions following preliminary comments, and then two months for review. The process was successful and project approval was granted by the U.S. Census Bureau in Fall 2013. This in turn required a three-month application and security review to obtain Special Sworn Status, a requirement for analyzing restricted data in the RDC secure computing lab.

Two other reasons also are relevant. One is that restricted micro data files can only be accessed through Census Research Data Centers (RDCs). The national RDC network that makes this possible is relatively new and very small. At the time I undertook my proposal, only fifteen such facilities were operating in the United States. The TXCRDC began operations in October 2012. Prior to that time the closest RDC facility was over 800 miles from Texas A&M University (at the Federal Reserve Bank in Chicago). Lab fees, travel costs, and other related expenses make research using restricted data under traditional (project cost recovery models) prohibitively expensive for dissertation projects. The TXCRDC Consortium implements a newer institutional access model that made this dissertation project possible.

Another reason is that methods to perform segregation analysis using microdata are very new. Prior to the development of the methods, use of microdata provided relatively minor benefits for segregation research; that being the ability to prepare special aggregate tabulations to supplement tabulations available in public census

summary files. The methods used in this study move beyond previous methods for performing segregation analysis and can exploit the benefits of microdata in new ways. Accordingly, both the source of the data and the method of analysis must be described in great detail in order to convey the important contributions that this study makes to the residential segregation literature. Below I begin by first describing the role of geography in measuring residential segregation as it is important for understanding the data and methodological choices that are made. I follow this by then providing more detailed descriptions of the data used, the methods of analysis, and the variables used in the study as motivated by existing sociological theory.

Geography

The question of how to define a neighborhood is one that comes up often in segregation research. Conceptual discussions can be and often are nuanced. In large scale empirical research, however, the practical choices are limited and decisions often are largely settled on preference and/or data availability. Generally, segregation studies use data from the U.S. Census Bureau, who for their own purposes of preparing data tabulations for local areas have already defined geographical areas based on a combination of administrative boundaries, sociodemographic patterns, and features of the natural and built environment. The lowest level of geography that the Census Bureau defines is known as the block, which is delineated "by streets, roads, railroads, streams and other bodies of water, other visible physical and cultural features, and the legal boundaries shown on Census Bureau maps" (U.S. Census Bureau). Thus in a typical neighborhood the census block is very similar to what one would think of as a

block in colloquial terms, a single area bounded by roads or other physical entities. The U.S. Census Bureau recognizes blocks as being particularly useful for planning and small area studies. It began tabulating data at the block level on a special case basis in the 1920 Census and expanded coverage in successive censuses ultimately encompassing the entire nation for the first time in 1990 in response to steadily growing user demand. The average population size of a block is generally less than 100 people though some individual blocks can be substantially larger (e.g., blocks containing college dorms).

The next level of geography is the block group, which is an aggregation of blocks, and is anywhere from 600 to 3,000 in population size with the typical size being 1,200. Block groups can then be aggregated up to the tract level, with tracts typically being on the order of 4,000 to 8,000 persons. Tracts then can be aggregated to the county level.[4] A major convenience in small area census geography, then, is that each level of geography is nested within the next largest level. This is useful for methodological work on how spatial scale affects small area research, including research focusing on segregation. The choice on what level of geography a neighborhood should be defined for studying segregation can be made with full knowledge of how results change based on area size.

The decision made for this study on which level of geography to measure segregation at is based on just such types of methodological explorations by examining

[4] Population sizes for blocks, block groups, and tracts are relatively constant due to census procedural goals. By contrast, the relationship between tracts and counties is highly variable as counties are divided into only as many tracts as needed, ranging from many hundreds to fewer than ten depending on the county population.

preliminary results at the block, block group, and tract level. What my co-author and I have found is that, other things equal, larger areas are more heterogeneous and thus it is more difficult to detect segregation within a metropolitan area and lower scores for segregation indices are yielded (Fox and Fossett 2013). At the lowest level, neighborhoods delimited by blocks are more homogenous and yield higher segregation scores on the dimension of evenness as a result. In the literature, the decision of what level to use varies with some arguing for tracts (Iceland et al. 2002; Iceland and Nelson 2008; Iceland et al. 2014) and others arguing for blocks (Fossett et al. 2014; Lichter et al. 2010). The argument for tracts is that they capture not only neighbors who live on the same block, but also those who live on the block across the street, which is something that blocks themselves cannot do (Iceland et al. 2002). This critique of using blocks should be acknowledged because generally we do think of the residents across the street as our neighbors as well, as opposed to thinking of them as living in a different neighborhood. However, the solution of using tracts, which often contain hundreds of blocks, is an over-reaction. An alternative is to use slightly larger areas comprised of a block and its surrounding blocks (i.e., the contiguous block neighborhood). This addresses the most valid aspects of the critique of using individual blocks and empirical studies implementing this demanding, computationally-intensive procedure report that the results are essentially indistinguishable from results obtained using blocks (Fossett 2011). Those who have defended the use of blocks have argued that, for studying segregation involving small populations and small areas, using areas larger than blocks is troublesome because it can lead to increased difficulty in detecting segregation

patterns (Fossett et al. 2014; Lichter et al. 2010). In some areas, this is of particular important for studying the Latino population. Therefore, in the case of studying Latinos, the choice to use blocks as the neighborhood level of geography is defensible. Finally, the general case for blocks can be defended on simple practical grounds based on the following two points. If tracts are adequate for the needs of detecting segregation in a city or community, there is no harm in using blocks as one will detect only the relevant level of segregation. However, if tracts are inadequate, blocks will reveal segregation that tracts would fail to detect. Thus one is not likely to be worse off when using blocks.

The area within which segregation is measured is another geographical question. For this study, I measure segregation within metropolitan Core-Based Statistical Areas (CBSAs), macro-level units that are extensions of metropolitan statistical areas (MSAs). Like MSAs, CBSAs are aggregations of counties whose populations are socially and economically integrated with an urban core. CBSAs are categorized as metropolitan and micropolitan with the distinction being that metropolitan CBSAs have urban cores with populations of 50,000 or more and micropolitan CBSAs have urban cores with populations of at least 10,000. The benefits of using CBSAs is that 1) they are constructed using county boundaries, which stay generally consistent over time and allow for easier framing of constant-boundary, cross-time comparisons, 2) they are viewed as appropriate macro-level units for conducting social and economic research on urban populations based on having boundaries that are constructed using principles accepted for many decades for the purposes of establishing metropolitan areas and micropolitan areas.

Measuring segregation at the level of metropolitan CBSAs is a good choice for the needs of the present study because CBSAs represent relatively self-contained housing markets. As such they can be seen as arenas within which individuals and groups seek to attain the best housing outcomes they can in the local housing market. For this reason, most comparative studies of segregation in recent decades adopt metropolitan CBSAs as the macro-level unit of analysis. I will focus on a CBSA sample of 60 CBSAs consisting of the 50 largest metropolitan CBSAs plus the 10 additional CBSAs with the largest Latino populations. I focus on CBSAs with large Latino populations to ensure that the micro-level samples I obtain for conducting detailed segregation analyses will be adequate for estimating micro-level models of residential attainment for the individual CBSA, especially in 2010 when microdata samples are smaller. In addition, focusing on larger metropolitan CBSAs helps ensure that the results of my analysis can be made public while meeting all relevant guidelines for protecting confidentiality when using restricted census data.

Data Sources

Data collected by the U.S. Census Bureau is by far the best available source of information for the study of cross-area and over time variation in racial residential segregation research because of its comprehensive coverage of the U.S. population combined with neighborhood level geography and individual-level information on race and Latino ethnicity. The population census is conducted every 10 years by the U.S. Census Bureau and canvases the entire population residing in the United States. The full (100%) count decennial census collects only basic demographic information on age, sex,

race, Latino ethnicity, and household structure. Additionally, however, a survey is conducted on a nationally representative sample of the U.S. population that collects more detailed information on demographic and social characteristics such as nativity, education, income, military service, occupation, etc. Up until 2000, this survey was conducted in conjunction with the decennial census and was referred to as the "long-form," as compared to the shorter census questionnaire received by everybody in the population which is referred to as the "short-form." The long-form was a 1-in-6 sample survey, meaning that it covered nearly 17 percent of the population. However, after 2000 the long-form was discontinued and an annual survey known as the American Community Survey (ACS) took its place.

The American Community Survey collects the same information that the long-form census survey once did, but it is conducted more frequently and only collects data on 1 percent of the population each year. The benefit of the ACS is that the data is very current, but this comes at the cost of implementing a smaller sample in comparison to the 17 percent sample that was available with the long-form. This can be overcome somewhat by pooling multiple survey years centered on the decennial census together since the cases do not overlap, but this strategy only works to a certain point because the time relevance of the data becomes more questionable as the range of years is expanded. However, after 2000 the American Community Survey is the best available source of data comparable to the long-form census survey that was conducted previously and so in order to move forwards, the ACS must be used. I add the additional note that the literature has not yet addressed the issue of whether analysis of segregation and

residential attainment will be affected by the transition from using the decennial long form sample to the ACS sample. The expectation is that they will be similar. But definitive methodological studies speaking to the issue are not yet available.

The data sources so far mentioned - the census short-form, the census long-form sample, and the American Community Survey - are distributed to the public in two formats, summary files and microdata files. The summary files provide limited information on individuals released in the form of tabulations aggregated to neighborhood level geography (e.g. blocks and block groups). These include tabulations on basic demographic information collected for the entire population such as race, Latino ethnicity, age, and household structure. In addition, tabulations on more detailed socioeconomic information such as income, education, poverty, and nativity are released in the summary files based on the data collected from representative samples for the U.S. population using the decennial long-form survey and the annual American Community Survey. The tabulations of sample data are released at more limited levels of geography, specifically meaning that they are not released below the block group level (as compared to the information from the population census, which is released down the block level in some tabulations). The importance of having block-level geography for this study is discussed further in a later section of this chapter.

For simpler tasks in segregation research where the goal is to measure racial residential segregation at the neighborhood level and provide descriptive results only, the summary file data can be adequate. Racial and ethnic composition at blocks and block groups is enough information to measure any of the five most widely recognized

dimensions of racial residential segregation for areas such as Metropolitan Statistical Areas (MSAs) or counties. However, the limited information in any given summary file table provides very few options for conducting micro-models of residential attainments where the units of analysis are individuals and several variables on individual social characteristics are needed as motivated by the spatial assimilation theoretical framework.

In order to conduct these types of analyses, microdata are needed that contain detailed information on social and economic characteristics for individuals in combinations with information about households and neighborhood-level geographic information. The Census Bureau does publicly distribute detailed microdata for individuals and households via the Public Use Microdata Sample (PUMS) files. The PUMS consists of up to a 5 percent representative sample of the U.S. population that includes individual records and some geographic information. For 2000 and previous decennial years, the 5 percent sample is a subset of the full 1-in-6 (17%) sample surveyed using the long-form census. After 2000, the 5 percent samples are constructed by pooling together 5 years of the American Community Survey. I will draw on the 2008-2012 5-year ACS file because it spans the five year period centered on the year of the 2010 decennial census.

While these public-use datasets are perfectly adequate for many purposes, they are unsatisfactory for segregation research due to inadequate information regarding residential location. The lowest level of geography available in these files is the Public Use Microdata Area (PUMA), which is an area with a minimum population of 100,000 delineated by individual State Data Centers based on guidelines laid out by the U.S.

Census Bureau. In addition to being too large to approximate any sociological notion of neighborhood, the guidelines for PUMA units are far from ideal. For example, the guidelines do not require that State Data Centers delineate the PUMAs around contiguous areas, and thus when PUMAs are actually mapped out it is revealed that many PUMAs in major metropolitan areas are broken up into fragments that are not contiguous (Siordia and Fox 2012).

Regarding the issue of size, PUMA units are far too large. On conceptual grounds they are too large to be thought of as approximating sociologically meaningful neighborhoods. The PUMA minimum size of 100,000 in population is approximately twenty-five times larger than the average population size of census tracts which themselves are already considered relatively too large for this analysis. On practical grounds PUMAs do not adequately subdivide urban space at a level needed to detect segregation. Out of 335 metropolitan CBSAs in 2000, only few had 25 or more PUMAs with most metropolitan areas having fewer than 10 PUMAs, and many metropolitan areas barely meeting the requirements to comprise even a single PUMA. In a preliminary study, I conducted the type of analyses presented in this study study using the 2000 census public-use (PUMS) files and measured segregation at the level of the Public Use Microdata Areas (PUMAs). What I found from these preliminary methodological analyses is that segregation and residential attainment dynamics can only be reasonably detected with PUMA-level analyses in the handful of large metropolitan areas (e.g., 2.5 million and above) that have at least 25 or more PUMAs. For this small subset of metropolitan areas, segregation can be detected only because the

segregation patterns involve large ethnic "clusters" that span dozens of contiguous census tracts as can be observed in the predominantly Latino East-Side Barrio in Los Angeles or the predominantly African American South-Side of Chicago. For these few cities, cross-city and cross-group variation in segregation scores based on PUMAs closely parallels cross-city and cross-group variation in segregation scores based on finer levels of geography such as census tracts or block groups[5].

But even for these few exceptional cities, scores of aggregate segregation indices are far lower when measured using PUMA units because PUMAs contain an aggregation of many smaller neighborhoods (e.g., on average about 25 tracts and 75 block groups) and this obscures variation in ethnic composition present at lower levels of spatial resolution that approximate neighborhoods more closely on conceptual and practical grounds. Significantly, this introduces a conservative bias against finding support for my research hypotheses. That is, analysis at the spatial scale of PUMAs tends to be conservative in the sense that it results in lower aggregate-level segregation scores, lower group differences in average residential attainments, and less striking spatial assimilation effects in individual-level residential attainment analyses. In light of this, my previous findings regarding segregation and residential attainment effects using PUMAs give me a strong basis for expecting that these findings will be even stronger and more pronounced when the analyses are conducted using smaller spatial units such as census blocks.

[5] For example, using block group level data in Los Angeles produces a White-Latino segregation score of 46.76 and a White-Asian segregation score of 30.82. In contrast, using PUMA level data produces a White-Latino segregation score of 27.16 and a White-Asian segregation score of 16.24.

The second and more alarming of these issues with PUMAs is that even when one accepts the large size of PUMAs based on treating them as extremely expansive neighborhoods, their validity is still open to question because PUMA guidelines do not require that PUMA units be either a single contiguous area or a compact area reflecting social and economic homogeneity in residential patterns. Instead, because PUMA guidelines assign first priority to protecting confidentiality in microdata files, people living in the same PUMA may reside in different fragments of the PUMA scattered across different parts of the metropolitan area and PUMA units can have highly irregular shapes that join together populations that are socially and economically heterogeneous (Siordia and Fox 2012). Therefore the PUMS data offers only limited opportunities for studying residential outcomes, even though the detailed information on individuals is very enticing to those who would like to run individual-level residential attainments models. In order to use the PUMS data in this fashion, one must only look at a small number of large metropolitan areas where there are enough PUMAs to justify doing the study (such as the Los Angeles Consolidated Metropolitan Statistical Area which has a total of 110 PUMAs), and where clusters of ethnically homogeneous neighborhoods form expansive barrios and ghettos, and also determine that PUMA fragmentation and irregularity is tolerable in the cities examined.

To summarize the available options for publicly distributed data, the summary files tabulate data on population distributions at finer levels of geography that approximate neighborhoods such as blocks, block groups, and tracts. For relatively simple tabulations such as race by Hispanic ethnicity they utilize the full (100% count)

population data but with little detail on social and economic characteristics. For more detailed tabulations such as race/ethnicity by income, the population estimates are necessarily based on samples which in the case of the American Community Survey for 2010 are very small (only 5 percent when combining 5 years of data). But even the most detailed tabulations include only two or three variables in addition to race, and, as more information gets added to the tabulation, the geographic information becomes more restrictive in size in order to protect the confidentiality of individuals and households in small areas. Consequently, detailed residential attainment analysis is not feasible using publicly distributed summary file tabulations. In contrast, the PUMS files provide detailed and disaggregated individual records with their coded responses on the census and census surveys that can meet the needs for conducting residential attainment analysis. But the sample is smaller at no more than 5 percent and the geographic information is severely limited so as to protect the confidentiality of the respondents. So detailed residential attainment analysis is not feasible using public distributed micro data files either.

For the type of analysis conducted in this study, the strengths of both summary file tabulations and microdata files are needed; small level geography is required to adequately assess neighborhood level segregation, and individual records are needed in order to conduct detailed micro-level analysis of residential attainments. These two requirements cannot be met at the same time using public data, but they can be met using the restricted-use files available in the Census Research Data Center environment. For this reason, I undertook the process of obtaining the restricted-access data. Requests to

use restricted data undergo rigorous review under Census regulatory guidelines and cannot be approved if the research proposed is feasible using public data. My proposal was approved and thus provides confirmation by experts within Census that the research I conduct in this study could not be accomplished with any publicly available data. This confirmation and project approval made it possible for me to apply for and receive federal security clearance needed to enter the Census Research Data Center facility where the data can be accessed.

The restricted files that were used for this study are the 2000 decennial census and the long-form census survey, the 2010 decennial census, and the 2008-2012 pooled American Community Survey. The decennial censuses cover 100% of the population and provide data on race and Latino ethnicity along with block level geography, making it possible to measure White-Latino segregation at the block level in any metropolitan area. The 2000 long-form census survey and the 2008-2012 American Community Survey provide detailed information on nationally representative sample of individuals and are used to construct the person-level independent variables for the individual attainment analysis and specify the analysis sample. I used the 2000 and 2010 censuses in order to have the ability to analyze and compare segregation at two points in time. I adopted the combined 2008-2012 American Community Surveys for the 2010 analyses in order to get the largest possible sample dataset centered on the year of the 2010 census.

Individual-Level Units and Variables

The units of analysis for the residential attainment analyses are non-Latino White and Latino[6] householders ages 15 and older. Householders were identified based on their response to the relationship question on the census form, while racial and ethnic information is drawn from the census questions on racial identification and Latino ethnicity. The census questionnaires treat Latino identity as separate from racial identity, so both data items are needed to identify non-Latino Whites. All other individuals in the household were omitted due to the fact that members of a household tend to move together, especially in the case of children, and so are not statistically independent cases. In addition, the choice to include only householders is relevant because the householders tend to have the most influence over household decisions and residential moves. There could be some concern regarding counting households as either White or Latino based solely on the racial and ethnic identification of the householder because of the presence of multiethnic households, however the majority of households are nearly or completely homogenous and so this is a minimal concern.

The dependent variables in this study are segregation-relevant residential outcome scores (y) that, as explained in more detail below, are scored based on "pairwise" proportion White (p) for the householder's area (block) of residence and additively determine the level of segregation on the dimension of evenness in the metropolitan area. More specifically, these are block-level scores of residential outcomes with the following quality; the group difference of means on these individual

[6] "Latino" in this analysis includes Latinos of all racial identifcations.

level scores yields the value of the aggregate-level (i.e., city-level) segregation index score computed using block data for householders. Two residential outcomes are modeled; one is the scoring of y that additively determines the value of the Separation Index (S) and one is the scoring of y that additively determines the Dissimilarity Index (D). The Dissimilarity Index is the most popularly used measure of the dimension of segregation known as eveness because of its simple calculations and because it is easy to interpret. The Separation Index also measures evenness but is less widely used.

I am able to estimate micro-level attainment models where individual scores relevant to calculating the Dissimilarity and Separation Indices are the outcomes being modeled because I draw on new formulations of popular segregation indices wherein the value of the index can be obtained as a difference of group means on index-specific scores on individual-level residential outcomes (Fossett 2009; forthcoming). Fossett's methodological studies establish that all popular measures of even distribution, including the Separation Index and the Dissimilarity Index that I use in the present analysis, can be formulated in a common difference of means framework where index values can be obtained from:

(1) $E = Y_1 - Y_2$

where:

E is the relevant segregation score on eveness

Y_1 is the mean score for Group1 in the analysis (i.e., $Y_1 = \Sigma y_{1i}/N_1$)

Y_2 is the mean score for Group 2 in the analysis (i.e., $Y_2 = \Sigma y_{2i}/N_2$)

The specific scoring for individual residential outcomes (y) is dependent on which segregation score is being used. I next review how individual residential outcomes are

scored so that it is possible to perform individual-level spatial attainment analysis of residential outcomes that can be used to obtain city-level segregation index scores.

The Separation Index (S), also known variously as the variance ratio index and eta squared, is a convenient and easily interpretable measure of uneven distribution which has been used in many empirical studies and reviewed favorably in many methodological studies of segregation indices (e.g., Duncan and Duncan 1955; White 1986; James and Taeuber 1985; Zoloth 1976). For the Separation Index, the dependent variable for analysis of individual residential outcomes (y) is scored based on the "pairwise" proportion White (p) for the householder's block of residence. By "pairwise" I mean that only the two groups in question are included in the denominator used to calculate proportion White. For each individual in the analysis, the (pairwise) proportion White (p) in their area of residence is assigned as their score (y). The pairwise nature of the calculation is not unusual; all measures of eveness are calculated using pairwise ethnic proportions. Accordingly, residential attainments that determine aggregate segregation must be calculated in a similar manner. The particular residential outcome score assigned here has the following quality; it is possible to obtain the scores of the Separation Index for the city by taking the difference of group means on these residential outcome scores. Fossett (2009; forthcoming) provides derivations showing how values of the Separation Index obtained as a difference of means in individual residential outcomes are equivalent to the value of the Separation Index computed by more familiar computing formulas for the measure. These derivations also establish a simple and appealing interpretation of the Separation Index. For example, the value of

the index indicates the White-Latino difference in (pairwise) contact with Whites. Under even distribution Whites and Latinos will experience the same level of contact with Whites and the difference will be zero (0); under complete segregation Whites will experience only contact with Whites and Latinos will experience no contact with Whites and the difference will be 100.

Fossett (2009; forthcoming) also shows that the Dissimilarity Index can be formulated as a difference of means between two groups. Specifically, the Dissimilarity Index can be calculated by assigning values of 1 or 0 to individuals on y based on a comparison between the pairwise proportion White (p) in their neighborhood (in this case, the block) and the pairwise proportion White in the city as a whole (P). If the proportion White in the individual's neighborhood is greater than the proportion White in the city as a whole, the individual receives a score of 1. If the proportion White in the individual's neighborhood is less than or equal to the proportion White in the city as a whole, the individual receives a score of 0. The average score for each group in the pairwise comparison (White-Latino) is then calculated and the difference in average scores is the Dissimilarity Index. Mathematically, this method produces the exact same score on the Dissimilarity Index that the conventional computing formulas do. The ready interpretation in this formulation is that the value of D indicates the White-Latino difference in percentage of the group that resides in neighborhoods where Whites are overrepresented based on the city-level P. This difference will be zero under even distribution and 100 when segregation is at its maximum. The resulting formulas for both segregation indices can thus be constructed like this:

(2) $S = (1/W)w_i y_i - (1/L)\Sigma L_i y_i$

Where y=p

(3) $D = (1/W)w_i y_i - (1/L)\Sigma L_i y_i$

Where y =1 if p > P and y = 0 if $p \leq P$

These formulations of the Separation Index and the Dissimilarity Index as simple differences of group means on the residential outcome of (pairwise) contact with Whites are attractive for the purposes of this study for both conceptual and practical considerations. On the conceptual side, the formulations link individual residential outcomes to aggregate-level segregation index scores in a mathematically simple and easy to understand way. On the practical side the formulations make it possible to investigate segregation by conducting individual-level analyses of segregation-relevant residential outcomes. And it also opens the possibilities of performing standardization and decomposition analyses based on regression analyses. That is, by running separate models for Whites and Latinos, one can assess in a quantitatively precise way how the average contact each group has with Whites is shaped by their average levels of relevant social characteristics and by their ability to translate these social characteristics into contact with Whites.

The independent variables in the analyses represent basic measures of socioeconomic status and acculturation as well as other factors that might affect where one lives and who they live with. These variables include household income, educational attainment, English ability, citizenship, military participation, and time spent in the U.S. I also include other demographic predictors of residential location such as

household type (married couple, single mother, etc), recent migration (within the past 5 years or 1 year), and age. While the process of acculturation is more complex than these few variables can capture, past studies show that they are among the most relevant factors for assessing the experiences of minorities, particularly foreign-born minorities, in U.S. society (Alba and Logan 1993; Yu and Myers 2007).

Education is measured using a 6 category ordinal variable where the lowest category is those who did not attend high school and the highest category is those with a post-graduate degree[7]. It is treated as an interval variable in the regression analyses based on findings that the linear specification performs as well as the ANOVA style six-category specification. Education is "centered" on those who completed high school (or GED). By "centered" I mean that each individual's score on education is expressed as a deviation from the value for the category of "completed high school". I center the independent variables in this manner where appropriate to obtain a more meaningful group comparison at the regression intercept or constant. In this case, comparisons of Whites and Latinos at the intercept can be interpreted as a comparison between Whites and Latinos who are high school graduates. Centering variables in this way involves only a simple additive rescaling of the scores for each variable, and as such it has no effect on the estimate of the standardized regression coefficient, its standard error, or other model statistics relating to effect size or statistical significance.

[7] For those who did not complete high school or an equivalency but also did not indicate what grade level they did complete, U.S.-born individuals and those who immigrated to the U.S. as children were coded as having attended (but not completed) high school while those who immigrated as adults were coded as having not attended high school. The results based on this coding decision were found to be robust after trying other variations.

Income is measured as the natural logarithm of household income and is centered on the mean income for a White individual who has completed high school (or GED). The English ability variable is based on a set of categories initially scaled from 0 to 3, with 0 indicating no English and 3 indicating either that the individual speaks only English or speaks English very well. This variable is centered on those who speak English very well. Citizenship is measured using a series of dummy variables for non-citizens, naturalized citizens, and U.S.-born citizens with U.S.-born citizens treated as the reference group. A dummy variable is included for recent immigrants, where those who immigrated in the last 15 years are coded as 1 (this would be immigration after 1985 for the 2000 analysis, and immigration after 1995 for the 2010 analysis). A dummy variable is also included for recent migration, where those who have moved in the past 5 years (in 2000) or the past year (in 2010) are coded as 1. This variable is meant to capture the effect of neighborhood stability. Military participation is coded as 1 if the respondent has ever participated in the military, which is defined as either currently being an active member of the armed forces or being a veteran based on prior service in the military. Household type is a set of dummy variables for married couple, single mother, and other. Age is also measured as a set of dummy variables, with categories for those who are age 15 to 29, age 30 to 59, and age 60 and over.

Methods of Analysis

An additional methodological innovation adopted in this study is the use of fractional logit regression to estimate how social characteristics affect segregation-relevant residential outcomes for Latinos and Whites. The method, which draws on the

generalized linear modeling (GLM) framework, was first introduced by Papke and Wooldridge (1996) in the econometrics literature and is specifically geared to modeling the mean of a bounded variable. The use of the word "logit" in the name of the method is potentially misleading as it may lead one to think that the dependent variable is a logit transformation of a proportion. In actuality, fractional logit does not transform the dependent variable in this way and instead models the mean of the dependent variable as scored in its original metric. The method involves nonlinear estimation wherein the curve describing the path of the mean for the dependent variable is constrained to follow a logistic "S" curve within the bounded range of the scale for the dependent variable when plotted in the original metric of the dependent variable. The model is estimated using the GLM framework. I conducted the analyses using the glm command in Stata 13. This involves the usual regression specification but specifying the link option as "logit" and the distribution family as "binomial". Coefficients are logit-style coefficients but, to reiterate, they are predicting the logit of the mean of the natural scores, not the mean of logit scores. The regression equations can be used to obtain predicted values either for the logit of the mean or, if desired, for the mean in the dependent variable's original metric bounded between 0 and 1 (based on applying the inverse logit transformation to convert logit predictions of the mean to the implied mean of the proportions).

Fractional logit has attractive qualities in comparison with other methods for modeling proportions because of its ability to constrain predictions within the bounds of 0 and 1 and because it does not require special procedures for handling cases that take

endpoint values. Linear regressions such as OLS do not guarantee that the predictions will remain within the bounds, and other non-linear techniques such as beta regression and OLS regression of logit transformed scores must use arbitrary rescaling to deal with cases that take endpoint values of 0 and 1 (Fossett, Fox, and Powers 2014; Kieschnick and McCullough 2003). Another attractive quality of implementing fractional logit regression is that it is estimated by quasi-likelihood methods which do not require that strong specific assumptions be made regarding the distribution of the error term. This is helpful when modeling a bounded dependent variable since distributions of residuals are likely to be heteroskedastic and non-normal. Quasi-likelihood estimation is achieved using the GLM framework by specifying the option for calculating robust standard errors in combination with the logit link and binomial distribution options (Wooldridge 2002).

I applied analytic weights when estimating the fractional logit regression models. The long-form census file is based on a 1 in 6 sample overall and the restricted-use 2008-2012 American Community Survey is roughly a 10 percent sample, but in some areas (census block groups) households are sampled at a higher rate than in other areas. Accordingly, when performing regression analysis using Stata it is necessary to use the analytic weights to obtain results that are representative of the population of interest while also getting meaningful significance tests that are not overinflated by frequency weighting.

I estimate micro-level residential attainment models separately for Whites and Latinos for the 60 largest metropolitan areas in the U.S. I present detailed quantitative

case studies for six cases for both 2000 and 2010 to illustrate the methodology and provide a sense of how segregation-determining residential attainment processes vary across cities and over time. These case studies are the Atlanta MSA, the Chicago MSA, the Houston MSA, the Los Angeles MSA, the San Diego MSA, and the Seattle MSA. The choice of cities is based on a desire to contrast cities with large, established Latino populations that are known for having moderate to high levels of Latino segregation (Houston, Los Angeles, Chicago, San Diego) with cities that have smaller but growing Latino populations where Latino segregation is known to be lower (Atlanta and Seattle).

Standardization and Decomposition

Once the regression coefficients are obtained, I apply regression standardization and decomposition techniques to determine how different factors contributed to determining the aggregate-level of segregation in the city. Specifically, I assess the impact of group differences on the means of the independent variables as well as group differences in "rates of return" (i.e., regression effect coefficients) for the independent variables. Variations on this well-known and widely used methodology have been a staple of demographic analysis at least since an early application by Evelyn Kitagawa (1955) that demonstrated how standardization and decomposition analysis could provide a better understanding of how differences in group means on an outcome could be broken down into specific terms quantifying the role of group differences in means on relevant factors influencing the outcome, group differences in rates of impact for these factors, and the interaction or joint impact of these two components. Later, following the rise of status attainment analysis, methodological studies by Althauser and Wigler

(1972) and Jones and Kelley (1984) extended the Kitagawa method to regression-based stratification analysis. Subsequent studies (Powers et al. 2011) have extended and refined the application of these methods in the case of nonlinear models such as the fractional logit model used here.

The application of the method here is quite basic and is implemented as follows. The first step is to estimate two group-specific attainment models, one for Whites and one for Latinos. Next the resulting group-specific coefficients can be used in combination with the group-specific means on the independent variables to generate model-based predictions for the mean of the dependent variable. By their nature, these predictions are inherently "standardized" on the independent variables. Choices for the "standard" used to generate the model-based predictions are varied over the four possible combinations of White means, White rates, Latino means, and Latino rates. The resulting set of four predicted means allows one to consider the predicted impact of changing minority rates (i.e., coefficients) to match those for Whites, changing minority means on independent variables to match those for Whites, or both in combination. Doing so provides insight into how the group difference in means on the dependent variable arises. Thus the relevant standardization equations are

(4) $Y_L = b_{L0} + (b_{L1} * x_{L1}) + (b_{L2} * x_{L2}).....+ (b_{Ln} * x_{Ln})$

(5) $Y_L = b_{L0} + (b_{L1} * x_{w1}) + (b_{L2} * x_{w2}).....+ (b_{Ln} * x_{wn})$

(6) $Y_L = b_{w0} + (b_{w1} * x_{L1}) + (b_{w2} * x_{L2}).....+ (b_{wn} * x_{Ln})$

(7) $Y_L = b_{w0} + (b_{w1} * x_{w1}) + (b_{w2} * x_{2w}).....+ (b_{wn} * x_{wn})$

Where equation (4) is the original equation for Latinos with Latino group means and rates of return, equation (5) calculates the predicted contact that Latinos would have with Whites if subjected to the White group means on the independent variables, equation (6) calculates predicted contact with Whites when Latinos are subjected to White rates of return, and equation (7) calculates predicted contact when Latinos are subjected to both the White group means and the White rates of return.

Note that equation (4) reproduces the observed Latino mean on segregation-relevant residential outcomes and equation (7) reproduces the observed White mean on these same residential outcomes. In each standardization exercise, the resulting difference between the two group means on the dependent variable yields a predicted city-level segregation score under the assumptions of the particular standardization exercise. The variations in the predicted Latino mean on residential outcomes under different assumptions (regarding means and rates) provides a basis for gaining deeper insight into the underlying origins of segregation at the city level. Specifically, the differing results can be compared to "decompose" and assess how group means and rates of return individually contribute to the difference in contact with Whites between the two groups, and how they interact. Comparing the difference in group means and group rates of return highlights the disparities between the two groups, the role of compositional effects and how that translates into residential inequality (Fossett and Cready 1998).

In addition to the standardization and components analysis, the individual impacts of micro-level factors on overall segregation can also be assessed and discussed.

Using the White and Latino group-specific models, predictions for the two groups can be generated by first setting all characteristics to be the same for both groups and then manipulating the values of the variable of interest. The relevant characteristics are set to equal the centered values noted earlier. This results in lower standard errors for the predictions and ensures that the comparisons are for combinations of characteristics that are sociologically relevant and regularly occurring in the populations. The difference in the resulting predicted means on contact with Whites produces the segregation score that would result if the two groups are matched on all other characteristics (at centered values) and only one specific characteristic is varied. For example, Whites and Latinos can be standardized on being U.S.-born citizens with a household income of $40,000, age 30 to 59, and living in a married couple household. The one variable that is permitted to change is education so that both groups can be set to having a high school degree or a postgraduate degree, and the predicted mean will vary accordingly. This exercise allows one to see how contact with Whites between Whites and Latinos changes as education levels change while holding all other factors constant. The same can also be done for varying levels of citizenship and income. This serves as a useful tool for gaining a better understanding of the impact that individual factors have on the residential outcomes that drive aggregate segregation patterns.

Cross-Area Analysis

The final analysis that I conduct in this study is a metropolitan area-level cross area analysis where the units are 50 MSAs in 2010 selected on a combination of population composition criteria. The MSAs were selected first on total population and

then on Latino population, with MSAs being excluded if the Latino population was over 10 percent Black or less than 60 percent Mexican/Central American/Other Latino. The reason for these selection criteria on the Latino population is that, as discussed in the previous chapter, the outcomes of Black Latinos are markedly different from others (Charles 2003; Massey and Lundy 1984) and in addition, predominately Cuban areas tend be unique as compared to other places as well due to enclave formation and settlement patterns rooted in a different history from the rest of the Latino population. The selection criteria exclude areas where Black Latinos predominate and also areas where Latinos are majority of Cuban descent. In this way, these other factors that may affect the results are controlled for.

There are six dependent variables that will be modeled using fractional logit regression: the observed Separation Index, the observed Dissimilarity Index, two standardized versions of the Separation Index, and two standardized versions of the Dissimilarity Index. The observed versions of the Separation Index and the Dissimilarity Index are the scores for each MSA as they are calculated based on the equations presented above. The Separation Index is the difference in average block-level pairwise proportion White (p) between Whites and Latinos in the MSA, and the Dissimilarity Index is the difference in the proportion of Whites and Latinos who live in blocks where the pairwise proportion White (p) is higher than the pairwise proportion White for the city as a whole (P).

The standardized versions of the Separation Index and the Dissimilarity Index are the index scores obtained for MSAs after Whites and Latinos have been equalized on

individual level social characteristics and on rates of return as outlined above in the description of the standardization techniques that will be applied after the micro-models are run. There are two variations on these standardized scores: the scores when Latinos have been given the White means on the independent variables and the scores when Latinos have been given the White rates of return estimated from the micro-models. The present study makes a significant contribution by modeling these standardized scores as well as the observed scores. The reason is that as the micro-models will demonstrate, there are micro-level factors that affect overall segregation patterns in a metropolitan area. These micro-level factors should not be controlled for in the MSA-level analysis using independent variables because of problems associated with the well-known "aggregate fallacy" of seeking to assess effects of variables that operate at the individual-level using aggregate-level measures. Specifically, controlling for individual-level factors at the aggregate level can potentially lead to erroneous conclusions about the direction and strength of the effects on the outcome being modeled (Fossett 1988; Fossett and Fox 2013).

I avoid this problem by modeling the standardized versions of the Separation Index and the Dissimilarity Index where the scores have been calibrated so that Whites and Latinos do not differ on individual social characteristics or rates of return. This controls for the effect of micro-level factors in a statistically appropriate way for an MSA-level analysis that stops short of performing a multi-level model analysis which would be both more complex and computationally intensive. The MSA-level predictors that will be included in the model are population size, percent non-White, whether it is

an area of long-term Latino settlement or an area that has only recently experienced Latino population growth and settlement (i.e. "new destinations"), and a battery of industry variables including percent of the labor force in the armed forces, percent in manufacturing, percent in agriculture and percent in retail. These are all MSA-level factors that potentially explain MSA-level variation in segregation patterns as demonstrated by others (Fossett, Fox and Saenz 2014; Iceland and Nelson 2008; Lichter et al. 2010).

Analysis Chapters

The next three chapters present the results of the main empirical analyses in this study and will proceed as follows. In Chapter 4 I will present and discuss the regression results from the micro-models for the six case studies (Atlanta, Chicago, Houston, Los Angeles, San Diego, and Seattle) in 2000 and 2010. I will then extend the case study analyses in Chapter 5 by presenting the standardization and decomposition results from the micro-models, demonstrating how specific micro-level factors affect overall segregation in each city and how the scores can be decomposed into differences in means and rates of return. In the final analysis chapter, Chapter 6, I will present the MSA-level regression results on the observed and standardized segregation scores and discuss how results change after micro-level factors have been appropriately controlled for using standardization techniques.

CHAPTER IV

MICRO-MODELS OF RESIDENTIAL ATTAINMENTS

Overview

In this first analysis chapter I present and discuss micro-models of residential attainments for 6 selected case study cities: Atlanta, Chicago, Houston, Los Angeles, San Diego and Seattle. For each city I conducted regression analysis using data from both 2000 and 2010 on the segregation relevant outcomes for both the Separation Index and the Dissimilarity Index. To review what is meant by "segregation relevant" outcomes, these are the individual scores that when averaged by group produce the components that determine the value of the segregation index in question. The first set of results that I discuss will be the group-specific micro-models of the segregation relevant outcome for the Separation Index, which is simply the pairwise proportion White at the block-level. Following that, I will review the results for the segregation outcome relevant for the Dissimilarity Index, which is a binary score based on whether or not the individual lives in a block with a higher pairwise proportion White than the pairwise proportion White for the city as a whole. Although there is a time component, the analyses are cross-sectional and so the ability to compare results between 2000 and 2010 is limited, but nevertheless changes over time will be discussed at the descriptive level.

Altogether there are many models presented in this chapter, but the goal of this part of the analysis is not to review every model and coefficient in detail but rather to

describe consistent patterns found overall. The models I present in this chapter are complex and there are many small nuances across cities and over time based on changes in census methodology, sample size, and survey implementation that cannot be discussed in full detail here. However, as I will show, the results tell stories that are consistent with theory and leave open the door for informed speculation and future questions to be explored. Much of the discussion will be anchored in the results for 2000 due to the fact that the sample size in 2000 was a great deal larger and more reliable. The 2010 results are generated using the 2008-2012 American Community Survey and therefore are based on a smaller sample obtained by combining five separate annual samples conducted over a five-year period. Following this chapter, I will take my interpretations of the models further in Chapter 5 by conducting standardization and components analysis, as well as generating predicted values based on specific profiles where the independent variables are set to chosen values that represent different positions in social standing. In Tables 1 and 2, I provide the descriptive statistics for the independent variables used in the models for both groups, Whites and Latinos, in each city in both 2000 and 2010. The variables were chosen guided by the spatial assimilation framework, which as discussed previously posits that socioeconomic status and acculturation are positively associated with residential mobility and integration with Whites. In addition, household structure and age are also determinants of residential outcomes due to their relationship with housing preferences, residential mobility patterns, and affordability.

Table 1. Descriptive Statistics for Non-Latino White Householders

	Atlanta		Chicago		Houston	
	2000	**2010**	**2000**	**2010**	**2000**	**2010**
Degree	3.06	3.25	3.03	3.26	3.10	3.27
Median Income	$59,380	$67,900	$58,600	$70,000	$56,420	$74,000
Military	24.77%	15.93%	21.53%	12.59%	23.91%	15.87%
U.S.-born citizen	96.77%	95.58%	90.60%	89.64%	95.69%	94.22%
Foreign-Born, U.S. Citizen	1.48%	2.51%	5.94%	7.04%	2.01%	2.98%
Foreign-Born, Non-Citizen	1.75%	1.91%	3.45%	3.32%	2.30%	2.80%
Recent Immigrant	1.64%	2.13%	3.53%	3.57%	1.93%	2.67%
English Ability	2.98	2.98	2.93	2.93	2.98	2.98
Age	47.16	50.63	50.17	52.13	48.30	51.23
Married Couple HH	59.55%	57.50%	55.74%	53.51%	58.14%	55.93%
Single Mother HH	6.03%	6.62%	6.42%	6.71%	6.59%	6.68%
Other Family HH	34.42%	35.88%	37.84%	39.78%	35.27%	37.39%
Recent Mover*	49.58%	12.32%	40.46%	10.20%	47.66%	14.31%

Table 1 (continued)

	Los Angeles		San Diego		Seattle	
	2000	**2010**	**2000**	**2010**	**2000**	**2010**
Degree	3.21	3.43	3.21	3.41	3.10	3.34
Median Income	$57,600	$73,000	$52,100	$68,000	$53,500	$70,000
Military	22.28%	13.14%	31.96%	20.82%	26.57%	16.00%
U.S.-born citizen	86.29%	83.52%	92.77%	91.15%	94.20%	92.63%
Foreign-born, U.S. Citizen	8.89%	11.82%	4.51%	5.76%	3.14%	4.33%
Foreign-Born, Non-Citizen	4.81%	4.66%	2.72%	3.09%	2.66%	3.04%
Recent Immigrant	4.75%	4.55%	2.32%	2.90%	2.42%	3.18%
English Ability	2.93	2.91	2.97	2.96	2.97	2.97
Age	51.31	53.62	50.37	52.27	48.07	50.45
Married Couple HH	48.54%	47.11	51.69%	49.94%	52.21%	49.83%
Single Mother HH	6.96%	6.76%	6.84%	6.62%	7.30%	6.63%
Other Family HH	44.51%	46.13%	41.47%	43.44%	40.49%	43.53%
Recent Mover*	43.27%	12.61%	50.08%	14.49%	48.94%	15.28%

*In 2000, a recent mover was a household that had moved in the last 5 years. After 2000, the survey question was changed and now refers to a household that has moved in the last year.

Table 2. Descriptive Statistics for Latino Householders

	Atlanta		Chicago		Houston	
	2000	**2010**	**2000**	**2010**	**2000**	**2010**
Degree	1.92	2.01	1.61	1.97	1.53	1.83
Median Income	$45,000	$36,600	$41,000	$45,000	$32,700	$40,000
Military	8.51%	4.37%	7.31%	3.84%	7.80%	4.35%
U.S.-born citizen	28.16%	27.70%	36.95%	40.22%	38.93%	39.14%
Foreign-Born, U.S. Citizen	17.10%	17.21%	24.15%	23.77%	18.95%	18.50%
Foreign-Born, Non-Citizen	54.74%	55.09%	38.89%	36.01%	42.12%	42.36%
Recent Immigrant	55.72%	44.18%	29.68%	20.67%	30.56%	26.19%
English Ability	2.02	2.06	2.13	2.20	2.13	2.10
Age	36.10	39.46	40.59	43.24	39.53	42.29
Married Couple Household	64.72%	58.63%	64.48%	57.14%	65.52%	58.43%
Single Mother Household	6.87%	12.30%	11.58%	14.82%	11.24%	14.21%
Other Family Household	28.40%	29.06%	23.93%	28.04%	23.23%	27.36%
Recent Mover*	76.66%	20.38%	52.90%	13.65%	57.81%	18.46%

Table 2 (Continued)

	Los Angeles		San Diego		Seattle	
	2000	**2010**	**2000**	**2010**	**2000**	**2010**
Degree	1.52	1.87	1.86	2.18	2.31	2.35
Median Income	$35,000	$45,000	$34,000	$44,000	$39,500	$46,200
Military	7.26%	4.02%	13.48%	9.87%	17.26%	6.94%
U.S.-born citizen	29.42%	35.04%	41.16%	46.14%	56.70%	47.15%
Foreign-Born, U.S. Citizen	25.22%	27.73%	23.45%	22.63%	15.98%	14.92%
Foreign-Born, Non-Citizen	45.36%	37.23%	35.38%	31.22%	27.32%	37.93%
Recent Immigrant	28.17%	15.20%	23.79%	15.36%	28.47%	29.64%
English Ability	2.05	2.10	2.27	2.30	2.51	2.40
Age	41.85	45.41	41.59	43.89	38.25	40.15
Married Couple Household	61.11%	53.28%	58.67%	54.87%	52.34%	48.64%
Single Mother Household	14.53%	17.38%	15.55%	16.20%	10.60%	13.04%
Other Family Household	24.36%	29.34%	25.78%	28.92%	37.06%	38.31%
Recent Mover*	51.19%	12.88%	59.26%	15.17%	71.37%	23.25%

*In 2000, a recent mover was a household that had moved in the last 5 years. After 2000, the survey question was changed and now refers to a household that has moved in the last year.

Results for Six Case Studies – The Separation Index

In Table 3 I present the observed scores on the Separation Index for the six case study cities in 2000 and 2010. To review how the score is calculated, the Separation Index is the difference between the group specific averages on block-level pairwise proportion White.

Table 3. Group-Specific Attainments Yielding the Separation Index

Group	2000	2010	Group	2000	2010
Atlanta			**Los Angeles**		
Whites	95.78	92.39	Whites	80.79	77.46
Latinos	68.60	61.81	Latinos	31.19	29.51
Separation Index	27.18	30.58	Separation Index	49.60	47.95
Chicago			**San Diego**		
Whites	91.63	88.95	Whites	85.75	81.66
Latinos	50.80	49.44	Latinos	51.61	48.03
Separation Index	40.83	39.51	Separation Index	34.14	33.63
Houston			**Seattle**		
Whites	83.94	78.60	Whites	96.09	93.43
Latinos	42.85	38.00	Latinos	86.79	81.54
Separation Index	41.09	40.60	Separation Index	9.30	11.89

Based on the Separation Index, White-Latino segregation increased by 3 points in Atlanta and by 2 points in Seattle from 2000 to 2010. In Chicago, Houston, Los

Angeles and Seattle segregation remained stable. For the cities where segregation has increased, the group-specific components reveal that the increase in segregation is due in large part to decreases in Latino contact with Whites, though White contact with Whites has dropped slightly as well. However for all cities regardless of changes in segregation, the pattern is that both Whites and Latinos are experiencing less neighborhood contact with Whites which is a reflection of changing demographic composition. Bear in mind that the Separation Index is insensitive to group composition as, if there is no group separation, group-specific contact with Whites will rise and fall in parallel with changing ethnic composition.

The micro-models of the segregation relevant outcome for the Separation Index are presented in Tables 4-9. Focusing first on the results for 2000, in general all of the effects operate in the direction predicted by spatial assimilation theory. For all groups in all cities, both income and education have a significant and positive effect on residential contact with Whites, with these effects often being large in magnitude. For Latinos, the effects of SES tend to be notably larger than for Whites which is especially the case for the effect of education on Latino contact with Whites. There is an intuitive reason for SES has a larger effect on contact with Whites for Latinos as compared to Whites. Whites overall tend to live in neighborhoods with high proportion Whites already, so there is little movement towards higher contact due to "ceiling" constraints and thus SES cannot have large effects.

Table 4. Fractional Logit Regressions for Separation Index Attainment Analyses for Atlanta GA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.0411**	0.0051	0.0419**	0.0053	0.2401**	0.0137	0.1564**	0.0139
Income (Ln)	0.0710**	0.0046	0.0363**	0.0048	0.0637**	0.0109	0.0392**	0.0121
Military	-0.1077**	0.0158	-0.1118**	0.0218	0.0572	0.0694	0.1703	0.1028
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	-0.2825**	0.0671	-0.3227**	0.0815	-0.3314**	0.0686	-0.3283**	0.0672
Nat. U.S. citizen	-0.2615**	0.0507	-0.3998**	0.0580	-0.0239	0.0634	-0.0491	0.0669
Recent immigrant	-0.4141**	0.0718	-0.1644*	0.0790	-0.2570**	0.0544	-0.3240**	0.0547
English ability	0.3136**	0.0327	0.3308**	0.0395	0.2479**	0.0212	0.2774**	0.0264
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.2418**	0.0184	-0.2098**	0.0284	-0.2332**	0.0396	-0.2025**	0.0526
Age 60+	0.2087**	0.0175	0.1845**	0.0185	0.4405**	0.0906	0.3260	0.0810
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.3597**	0.0309	-0.3489**	0.0425	-0.1492	0.0796	-0.0858	0.0674
Other family	-0.5425**	0.0134	-0.4173**	0.0165	-0.2004**	0.0391	-0.2046**	0.0458
Recent mover	-0.1007**	0.0132	-0.2048**	0.0271	0.1180**	0.0439	-0.1507**	0.0521
Constant	1.6710**	0.1073	1.2236**	0.1275	-0.3221*	0.1281	-0.3221*	0.1341
Constant (centered)	3.4097**	0.0131	2.6615**	0.0150	1.5441**	0.0540	1.2211**	0.0526

Note: * = $p < 0.05$; ** = $p < 0.01$.

Table 5. Fractional Logit Regressions for Separation Index Attainment Analyses for Chicago IL

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.1799**	0.0032	0.1352**	0.0033	0.1983**	0.0052	0.1712**	0.0063
Income (Ln)	0.1196**	0.0025	0.0633**	0.0028	0.0977**	0.0046	0.0481**	0.0059
Military	-0.1097**	0.0098	-0.1328**	0.0142	0.1897**	0.0265	0.1088*	0.0457
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	-0.2532**	0.0265	-0.2404**	0.0336	-0.1868**	0.0201	-0.2655**	0.0281
Nat. U.S. citizen	-0.0816**	0.0169	-0.0799**	0.0206	-0.0177	0.0182	-0.0769**	0.0243
Recent immigrant	-0.1672**	0.0260	-0.0696*	0.0321	-0.0953**	0.0184	0.0484	0.0276
English ability	0.2026**	0.0117	0.1732**	0.0153	0.1934**	0.0080	0.2354**	0.0122
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.1887**	0.0118	-0.1701**	0.0159	-0.1455**	0.0167	-0.1147**	0.0268
Age 60+	0.2447**	0.0096	0.2348**	0.0109	0.1107**	0.0231	0.1431**	0.0269
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.4545**	0.0189	-0.3353**	0.0259	-0.2751**	0.0233	-0.2437**	0.0314
Other family	-0.4540**	0.0079	-0.3703**	0.0095	-0.0278	0.0153	-0.0908**	0.0200
Recent mover	0.1108**	0.0081	-0.0484**	0.0159	0.3001**	0.0135	0.0996**	0.0280
Constant	0.2360**	0.0430	0.6340**	0.0534	-1.6648**	0.0499	-1.2368**	0.0658
Constant (centered)	2.4114**	0.0078	2.0606**	0.0095	0.2981**	0.0155	0.2955**	0.0194

Note: * = $p<0.05$, ** = $p<0.01$

Table 6. Fractional Logit Regressions for Separation Index Attainment Analyses for Houston TX

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.1907**	0.0035	0.1395**	0.0042	0.2794**	0.0051	0.2293**	0.0060
Income (Ln)	0.0998**	0.0030	0.0666**	0.0036	0.0771**	0.0044	0.0535**	0.0055
Military	-0.0990**	0.0099	-0.1103**	0.0163	0.1088**	0.0232	0.0828	0.0394
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	-0.0981*	0.0414	-0.0873	0.0632	-0.2506**	0.0193	-0.2318**	0.0281
Nat. U.S. citizen	-0.0991**	0.0303	-0.1312**	0.0375	-0.0315	0.0180	-0.0280	0.0253
Recent immigrant	-0.1836**	0.0470	-0.0877	0.0686	-0.1874**	0.0183	-0.0042	0.0267
English ability	0.2923**	0.0238	0.3097**	0.0372	0.1679**	0.0079	0.2526**	0.0119
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.1713**	0.0121	-0.1673**	0.0194	-0.1902**	0.0157	-0.1950**	0.0246
Age 60+	0.1579**	0.0108	0.1386**	0.0135	-0.0025	0.0238	0.0843**	0.0274
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.2871**	0.0185	-0.3010**	0.0300	-0.1655**	0.0226	-0.2784**	0.0303
Other family	-0.3715**	0.0086	-0.3325**	0.0120	-0.0489**	0.0144	-0.1283**	0.0195
Recent mover	0.0940**	0.0085	-0.0814**	0.0176	0.2334**	0.0134	0.0530*	0.0238
Constant	-0.6652**	0.0774	-0.6285**	0.1164	-1.7437**	0.0487	-1.8607**	0.0604
Constant (centered)	1.5908**	0.0086	1.2448**	0.0119	0.0903**	0.0140	-0.1099**	0.0186

Note: * = $p<0.05$, ** = $p<0.01$

Table 7. Fractional Logit Regressions for Separation Index Attainment Analyses for Los Angeles CA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.2631**	0.0026	0.1570**	0.0028	0.2784**	0.0031	0.2298**	0.0040
Income (Ln)	0.1056**	0.0020	0.0692**	0.0024	0.0916**	0.0030	0.0514**	0.0039
Military	-0.1552**	0.0074	-0.1584**	0.0119	0.0447**	0.0140	0.0242	0.0241
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	-0.0238	0.0177	0.0804**	0.0248	-0.4456**	0.0117	-0.4138**	0.0176
Nat. U.S. citizen	0.1425**	0.0119	0.1811**	0.0141	-0.2117**	0.0103	-0.1760**	0.0143
Recent immigrant	-0.0032	0.0192	-0.0641*	0.0264	-0.0571**	0.0105	0.0665**	0.0192
English ability	0.1170**	0.0098	0.0378**	0.0116	0.1967**	0.0047	0.2516**	0.0078
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.1254**	0.0097	-0.1373**	0.0150	-0.2570**	0.0102	-0.3058**	0.0178
Age 60+	0.2341**	0.0072	0.1965**	0.0091	0.1227**	0.0124	0.2021**	0.0148
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.3275**	0.0140	-0.3387**	0.0231	-0.2146**	0.0124	-0.3040**	0.0190
Other family	-0.1830**	0.0060	-0.2167**	0.0080	0.0894**	0.0084	0.0333**	0.0118
Recent mover	0.1120**	0.0062	-0.0095	0.0127	0.2082**	0.0078	0.2020**	0.0166
Constant	-0.7799**	0.0345	-0.0953*	0.0410	-2.3899**	0.0326	-2.2657**	0.0428
Constant (centered)	1.1472**	0.0068	1.0222**	0.0089	-0.3322**	0.0090	-0.5394**	0.0121

Note: * = p<0.05, ** = p<0.0

Table 8. Fractional Logit Regressions for Separation Index Attainment Analyses for San Diego CA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.2201**	0.0041	0.1282**	0.0046	0.2252**	0.0070	0.1355**	0.0083
Income (Ln)	0.0782**	0.0034	0.0517**	0.0038	0.0550**	0.0063	0.0427**	0.0069
Military	-0.2674**	0.0103	-0.3092**	0.0163	0.1276**	0.0242	0.1673**	0.0361
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	0.1105**	0.0389	0.0474**	0.0524	-0.4225**	0.0266	-0.3160**	0.0357
Nat. U.S. citizen	0.1019**	0.0241	0.1520	0.0295	-0.3440**	0.0234	-0.3460**	0.0306
Recent immigrant	-0.0686	0.0434	0.0130**	0.0541	-0.0528*	0.0245	-0.0468	0.0381
English ability	0.1078**	0.0246	0.2109**	0.0298	0.1580**	0.0117	0.2272**	0.0159
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.1681**	0.0138	-0.2042**	0.0209	-0.0958**	0.0214	-0.0827*	0.0322
Age 60+	0.3330**	0.0116	0.3070**	0.0149	0.1001**	0.0272	0.1610**	0.0322
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.3660**	0.0218	-0.3895**	0.0370	-0.2504**	0.0264	-0.3684**	0.0382
Other family	-0.1636**	0.0097	-0.1755**	0.0131	0.1422**	0.0194	0.0312	0.0248
Recent mover	-0.0070	0.0099	-0.0220	0.0183	0.0630**	0.0183	0.1100**	0.0313
Constant	0.0982	0.0810	-0.0335	0.0969	-1.0569**	0.0709	-1.1667**	0.0796
Constant (centered)	1.6406**	0.0113	1.3689**	0.0141	0.4148**	0.0209	0.2098**	0.0252

Note: * = $p<0.05$, ** = $p<0.01$

Table 9. Fractional Logit Regressions for Separation Index Attainment Analyses for Seattle WA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.1181**	0.0038	0.0962**	0.0043	0.1552**	0.0151	0.1258**	0.0147
Income (Ln)	0.0765**	0.0031	0.0539**	0.0036	0.0381**	0.0128	0.0301*	0.0133
Military	-0.1854**	0.0101	-0.2076**	0.0157	0.0027	0.0419	-0.0724	0.0689
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	0.0052	0.0372	-0.0215	0.0484	-0.3887**	0.0735	-0.4603**	0.0749
Nat. U.S. citizen	0.0079	0.0250	0.0062	0.0337	-0.1929**	0.0617	-0.2797**	0.0697
Recent immigrant	-0.2574**	0.0400	-0.2177**	0.0507	-0.0476	0.0693	-0.1398*	0.0662
English ability	0.1197**	0.0186	0.2512**	0.0268	0.1696**	0.0294	0.1387**	0.0316
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.2273**	0.0121	-0.2498**	0.0191	-0.1182**	0.0434	-0.1370*	0.0556
Age 60+	0.2704**	0.0116	0.2812**	0.0138	0.1933*	0.0764	0.2508**	0.0717
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.3640**	0.0196	-0.4351**	0.0307	-0.1571*	0.0660	-0.2088**	0.0646
Other family	-0.3214**	0.0091	-0.3068**	0.0120	-0.0920*	0.0408	-0.1369**	0.0476
Recent mover	-0.2082**	0.0093	-0.1919**	0.0173	-0.0236	0.0486	-0.0009	0.0519
Constant	2.0198**	0.0634	1.2269**	0.0866	1.0502**	0.1390	0.9530**	0.1564
Constant (centered)	3.3849**	0.0100	2.7170**	0.0121	2.2523**	0.0508	1.9243**	0.0446

Note: * = p<0.05, ** = p<0.01

For instance, if Whites are living on average in 90 percent White neighborhoods, SES does not have the potential to make much more of a difference. Additionally, to the extent that this pattern is observed when pairwise percent White is lower than 85-90, it indicates that an "across-the-board" group effect applies to all Whiles regardless of socioeconomic status.

In contrast, Latinos tend to live in neighborhoods with a much lower proportion White, meaning that SES can potentially have a larger impact and move Latinos higher along the scale of proportion White. Taking into account that fractional logit models the outcome along an "S" curve, the nonlinear logit effect will have a larger impact on residential outcomes for individuals whose "baseline" contact with Whites is in the middle of the range (i.e., 0.35-0.65) where the slope of the "S" curve is steepest. This is where Latinos tend to be located. In contrast, the impact is smaller for individuals whose "baseline" contact with Whites is at the top of the curve as is typical for Whites or at the bottom of the curve (but this is empirically less common). In every city, education appears to have a larger effect on Latino contact with Whites than income, though the positive effect of income is consistently significant in every city and in every year. It is important to note that education and income do not vary independently of one another, an issue that is not accounted for in these models but warrants caution in discussing the independent effects of education and income. On average income is higher for persons with higher education and, because annual income has a high "transitory" component, the effect of education can be interpreted partly in terms of long-term (less transitory)

income potential as well as other aspects of socioeconomic status. Education could very possibly be moderating income.

Other variables that are important for spatial assimilation theory are the ones related to acculturation. These include nativity, citizenship, year of immigration and English language ability. In the models all of these affects are accounted for and what I find is that, with only a few exceptions, these factors matter a great deal for Latino residential outcomes. To some extent they are positive predictors for Whites as well, but the percentage of Whites who are foreign-born, non-citizens and who do not speak English is not very large in most cases so these effects are statistically more volatile and empirically less important for modeling group residential attainments. In Los Angeles, San Diego and Seattle, the effects of immigration and citizenship are inconsistent and oftentimes insignificant for Whites. For Latinos, the story is much clearer, revealing that being foreign-born, having lower English-speaking ability, and being a recent immigrant all have negative impacts on residential contact with Whites. There is some variation across cities regarding these effects however. For instance, while being a non-U.S. citizen has a significantly negative impact on Latino residential contact with Whites as compared to being U.S.-born, in Atlanta, Chicago and Houston, there is no significant difference between naturalized U.S citizens and U.S.-born citizens. Thus across all cities, the consistent penalty is on non-U.S. citizens.

For the most part, being a recent immigrant (immigrated in the last 15 years) is also negatively associated with contact with Whites for Latinos. There is only one city where this is not the case and that is in Seattle, where recent immigrants do not

significantly differ in their outcomes from those who aren't. Here it is possible to argue that recent immigrants are likely to initially settle in ethnic enclaves where social support is available as they adjust to a new life and get situated and integrated into the labor market. One is not likely to find enclaves in Seattle as they would in Los Angeles and Chicago because of the lower proportion Latino there and the predominately White neighborhoods, and thus recent immigrants may end up settling in neighborhoods that are not very different from neighborhoods that other Latinos live in.

A variable outside of the traditional spatial assimilation framework but clearly plays a role in segregation dynamics is military participation. The relationship between military experience and racial residential segregation has not been extensively explored, but its effect on contact with Whites in these models tells a story that is worthy of discussion. For Whites, participation in the military, either active or past, results in less neighborhood contact with other Whites in comparison to those who have not been in the military. In contrast, Latinos who are participating or have participated in the military have more contact with Whites than those who have no military experience. These opposite effects show a pattern of integration, where Whites and Latinos who have military experience live in neighborhoods with a lower proportion of their own group in comparison to those who have no military experience. This is potentially related to spatial assimilation theory based on the assumption that military experience provides an acculturation experience. But the effect also can be interpreted in other ways, for example, the contact hypothesis. There is not a clear basis for distinguishing

between these interpretations here, but it is a significant effect in this model and should be accounted for.

The one final thing about the effects in 2000 that warrants mention is the consistent pattern of single motherhood. There is almost always a significant penalty on single mother households as compared to married couple households for both Whites and Latinos, with the effect sometimes being larger for Whites than for Latinos. This effect highlights the relative disadvantage that single mother households have in terms of housing and neighborhood outcomes even controlling for socioeconomic status. A plausible interpretation of this effect that applies well for Latinos is that single-mother households rely more heavily on kin and friendship networks and based on this are less likely to locate way from members of their own ethnic group. A related interpretation that may be relevant for single mothers who are White is that they rely more heavily on mass transit and are less drawn to suburban living arrangements where married couple White households are typically found.

In the last line of the table are the constants for the models when degree has been centered on high school diploma or equivalent, income has been centered on the mean income for Whites who have completed a high school diploma or equivalent, and English language ability is set to "Speaks English only or very well." This constant represents the mean outcome for somebody who holds these characteristics and is also non-military, is a U.S.-born citizen, is age 30-59, and lives in a married couple household. The advantage of centering the constant is so that the value becomes realistic

and meaningful. In the following chapter these centered constants will be revisited as part of the standardization analysis.

The interpretations thus far have been based on the results for 2000 because of the greater reliability of the data. The next task is to compare the results for 2010 to 2000 and review what has changed. Overall, the effects observed in 2000 stay consistent over time, with socioeconomic status, nativity, citizenship and immigration still for the most part following along a spatial assimilation trajectory. However, the effects are overall smaller and weaker in 2010 than they were in 2000. For example, in all six cities the effects of education and income were reduced for Latinos and in all cities except Atlanta they were reduced for Whites. The pattern is less clear for the acculturation effects but there are also signs of them being weaker and less consistent as well, particularly in the case of citizenship and immigration.

There are two possible explanations for why the effects weaken in 2010. The first is that a process of integration has been occurring over the past decade and socioeconomic status and acculturation matter less for residential outcomes because more Latinos are living with Whites in 2010 than they are in 2000. However, there have been no notable drops in segregation and in fact segregation is sometimes rising between Whites and Latinos. So this interpretation is not initially plausible. The second explanation is technical in nature: the effects are weaker because the sample is much smaller in the 2010 analysis than it is in 2000 and the observations are spread over five years while the dependent variable is measured for a single year. This is a legitimate possibility though it is one that cannot be easily explored due to the nature of the

restricted data that was used in this study. It is best to simply acknowledge that using the smaller and less reliable samples after 2000 complicates the interpretation of cross-time comparisons. This is an issue that may be resolved by future methodological studies. But until those are available, I can only exercise caution.

One last comparison that needs to be discussed for the results based on the Separation Index is how the outcomes vary across the six cities. This task is descriptive in nature because the micro-models were run separately for each city and so statistical tests for comparing the coefficients in these case studies are not readily available. But the main finding that can be gathered from these city-specific results is that for Whites, the effects of socioeconomic status are stronger in cities where the Latino population is moderate to large in relative size. In Chicago, Houston, Los Angeles and San Diego, the greater likelihood of Whites having residential contact with Latinos means that having higher socioeconomic status makes it more likely that a White household with live in a Whiter neighborhood. In comparison, cities like Seattle where the Latino population is low means that regardless of socioeconomic position, Whites are likely to live in neighborhoods with a high proportion of other Whites simply due to the demographic composition of the city. There is less of a contrast between low and high Latino cities for Latino outcomes. In all six cities, socioeconomic status has a large and positive effect on Latino residential contact with Whites.

Results for Six Case Studies – The Dissimilarity Index

In this section I review the micro-models of the segregation relevant outcome for the Dissimilarity Index. In Table 10 I present the Dissimilarity Index scores for the six

case study cities, which is calculated as the difference in the proportion of Whites who live in blocks where Whites are overrepresented and the proportion of Latinos who live in blocks where Whites are overrepresented.

Table 10. Group-Specific Attainments Yielding the Dissimilarity Index

Group	2000	2010	Group	2000	2010
Atlanta			**Los Angeles**		
Whites	81.07	81.68	Whites	84.62	84.68
Latinos	24.11	28.66	Latinos	20.46	22.35
Dissimilarity Index	56.96	53.02	Dissimilarity Index	64.16	62.33
Chicago			**San Diego**		
Whites	83.63	82.62	Whites	80.59	80.80
Latinos	20.28	24.16	Latinos	26.37	29.89
Dissimilarity Index	63.35	58.46	Dissimilarity Index	54.22	50.91
Houston			**Seattle**		
Whites	82.00	82.48	Whites	68.66	69.66
Latinos	23.52	26.44	Latinos	23.40	32.06
Dissimilarity Index	58.48	56.04	Dissimilarity Index	45.26	37.60

In contrast to the Separation Index, the Dissimilarity Index suggests that segregation is decreasing in all six cities. This at first may seem as if the two scores are at odds with one another, it is actually due to the fact that the Separation Index and the

Dissimilarity Index are measuring different residential outcomes. The Separation Index measures the average difference in residential contact with Whites, while the Dissimilarity Index measures the average difference in group proportion attaining parity with the city level proportion White. Recalling the observation in the previous section that all groups are experiencing a decrease in contact with Whites because of changing demographics, the declines in the Dissimilarity Index trace to consistent increases in the proportions of Latinos who are living in areas where proportion White equals or exceeds the city level proportion White. Because the Latino population is growing in relative size in each city, the threshold for attaining parity in contact with Whites is easier to attain as the city level proportion White decreases from 2000 to 2010. This can be observed in the change in the Latino component in all cities, but especially in Seattle.

While the Dissimilarity Index is the more popular measure of evenness in the literature, its binary scoring at the individual level makes it more complicated for interpreting these types of micro-models as compared to the Separation Index, which is measured as a continuous proportion. One reason why it is more difficult is that the scoring of segregation-relevant residential attainments for the Dissimilarity Index is entirely dependent on the ethnic composition of the city. Individuals only get a score of 1 if the proportion White in their block is higher than the city proportion White, and therefore the threshold for receiving a score of 1 varies from city to city. In cities with a high proportion White, the threshold to reach in order to receive a score of 1 is much higher. Thus comparing city-specific models and comparing the same city over time requires caution due to the role of changing ethnic composition. Thinking from the point

of view of individuals striving to attain residential outcomes, one must think carefully about what it means to attain a "1" in Los Angeles based on a 42% White neighborhood versus attaining a "1" in Seattle based on a 88% White neighborhood. With this in mind, I will proceed to discuss the micro-models for the Dissimilarity Index, presented in Tables 11-16 and again place my focus on overall patterns and briefly comment on how they compare to the results for the Separation Index.

The first thing to note is that the models again reveal a strong spatial assimilation dynamic based on the effects of socioeconomic status. Both education and income have significant and positive effects on the likelihood of living in a block with an overrepresentation of Whites. In nearly all cases, education specifically has a high impact on segregation. Additionally, the effects of acculturation are also significant and operate in predictable ways. Latinos who are foreign-born are less likely than U.S.-born Latinos to live in blocks where Whites are overrepresented, and English ability has a significantly positive effect on this outcome. The acculturation effects are not as strong for Whites and often they are not significant, but this is especially to be expected with the Dissimilarity Index because the outcome is merely whether or not the individual lives in a neighborhood where Whites are overrepresented. Thus, small changes in neighborhood composition that are readily detected in the analysis for S may not be enough to move an individual above the cross-over point from 0 to 1.

Table 11. Fractional Logit Regressions for Dissimilarity Index Attainment Analyses for Atlanta GA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.0635**	0.0066	0.0856**	0.0085	0.2977**	0.0258	0.2091**	0.0253
Income (Ln)	0.0975**	0.0059	0.0489**	0.0077	0.1101**	0.0306	0.0454	0.0251
Military	-0.1594**	0.0203	-0.1727**	0.0352	-0.0686	0.1111	0.0247	0.1595
U.S.-born citizen (ref)	---		---	---	---	---	---	---
Non-U.S. citizen	-0.2467**	0.0902	-0.3019*	0.1197	-0.5594**	0.1196	-0.5452**	0.1205
Nat. U.S. citizen	-0.2947**	0.0674	-0.3593**	0.0842	-0.1392	0.0997	-0.2657*	0.1059
Recent immigrant	-0.6235**	0.0948	-0.5291**	0.1203	-0.2777*	0.1103	-0.3515**	0.1134
English ability	0.4431**	0.0424	0.4598**	0.0680	0.4670**	0.0495	0.5094**	0.0586
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.4056**	0.0238	-0.3925**	0.0432	-0.4281**	0.0861	-0.4301**	0.1136
Age 60+	0.2507**	0.0225	0.2795**	0.0303	0.4759**	0.1467	0.4050**	0.1255
Married couple (ref)	---		---	---	---	---	---	---
Single mother	-0.5095**	0.0394	-0.4506**	0.0671	-0.4889**	0.1568	-0.3399*	0.1440
Other family	-0.7558**	0.0174	-0.6067**	0.0264	-0.2135**	0.0785	-0.1890*	0.0858
Recent mover	-0.1568**	0.0175	-0.2655**	0.0389	0.0285	0.0809	-0.1075	0.1034
Constant	-0.5751**	0.1388	-0.3332	0.2155	-3.3938**	0.3376	-2.4464**	0.2882
Constant (centered)	1.8634**	0.0177	1.7044**	0.0252	-0.2876**	0.0929	-0.0480	0.0870

Note: * = p<0.05, ** = p<0.01

Table 12. Fractional Logit Regressions for Dissimilarity Index Attainment Analyses for Chicago IL

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.2578**	0.0050	0.2174**	0.0057	0.3579**	0.0111	0.2892**	0.0126
Income (Ln)	0.1719**	0.0039	0.0907**	0.0048	0.2103**	0.0148	0.0635**	0.0137
Military	-0.1610**	0.0148	-0.2054**	0.0243	0.2176**	0.0475	0.0555	0.0783
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	-0.3558**	0.0411	-0.3386**	0.0596	-0.4152**	0.0454	-0.4996**	0.0615
Nat.U.S. citizen	-0.1153**	0.0258	-0.0998**	0.0362	-0.1390**	0.0367	-0.1131*	0.0460
Recent immigrant	-0.3267**	0.0415	-0.1564**	0.0587	-0.2864**	0.0474	0.0039	0.0669
English ability	0.3050**	0.0180	0.2509**	0.0265	0.4080**	0.0211	0.4402**	0.0295
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.2219**	0.0200	-0.2009**	0.0298	-0.3023**	0.0375	-0.1885**	0.0535
Age 60+	0.3739**	0.0145	0.3513**	0.0191	0.4206**	0.0474	0.3925**	0.0516
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.5877**	0.0281	-0.5116**	0.0440	-0.5451**	0.0564	-0.4582**	0.0668
Other family	-0.5991**	0.0125	-0.5131**	0.0171	-0.0599	0.0324	-0.1081**	0.0396
Recent mover	0.1811**	0.0129	-0.0099	0.0290	0.4343**	0.0299	0.2201**	0.0547
Constant	-1.5443**	0.0665	-0.6155**	0.0918	-5.0482**	0.1592	-3.3462**	0.1581
Constant (centered)	1.6224**	0.0122	1.4836**	0.0167	-0.9846**	0.0320	-0.7908**	0.0373

Note: * = p<0.05, ** = p<0.01

Table 13. Fractional Logit Regressions for Dissimilarity Index Attainment Analyses for Houston TX

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.3511**	0.0072	0.2667**	0.0092	0.5046**	0.0109	0.3848**	0.0126
Income (Ln)	0.1554**	0.0054	0.1258**	0.0072	0.1375**	0.0121	0.0786**	0.0129
Military	-0.1868**	0.0203	-0.1870**	0.0370	0.0998*	0.0454	0.0884	0.0747
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	-0.0589	0.0889	-0.0380	0.1399	-0.5140**	0.0461	-0.5187**	0.0611
Nat.U.S. citizen	-0.0971	0.0624	-0.2438**	0.0795	-0.1852**	0.0385	-0.1463**	0.0501
Recent immigrant	-0.3105**	0.0997	-0.0934	0.1550	-0.2231**	0.0476	0.1474*	0.0634
English ability	0.4623**	0.0410	0.5402**	0.0731	0.3422**	0.0208	0.4544**	0.0286
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.1867**	0.0277	-0.1392**	0.0478	-0.3281**	0.0357	-0.3196**	0.0522
Age 60+	0.1985**	0.0212	0.0903**	0.0301	0.2584**	0.0506	0.2236**	0.0544
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.4427**	0.0384	-0.4937**	0.0670	-0.2736**	0.0532	-0.4373**	0.0672
Other family	-0.5504**	0.0181	-0.5557**	0.0279	-0.0263	0.0314	-0.1449**	0.0402
Recent mover	0.2708**	0.0182	-0.0848*	0.0408	0.4097**	0.0302	0.1101*	0.0497
Constant	-2.2954**	0.1340	-1.9386**	0.2298	-4.1719**	0.1339	-3.4802**	0.1474
Constant (centered)	1.3481**	0.0173	1.4725**	0.0266	-0.7608**	0.0297	-0.5619**	0.0361

Note: * = $p<0.05$, ** = $p<0.01$

Table 14. Fractional Logit Regressions for Dissimilarity Index Attainment Analyses for Los Angeles CA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.4222**	0.0055	0.2729**	0.0063	0.4498**	0.0062	0.3594**	0.0078
Income (Ln)	0.1613**	0.0037	0.1152**	0.0047	0.1430**	0.0072	0.0780**	0.0083
Military	-0.2593**	0.0158	-0.2742**	0.0265	-0.0017	0.0260	-0.0269	0.0434
U.S.-born citizen (ref)	---	---	---	---	---	---	----	---
Non-U.S. citizen	-0.0611	0.0359	0.1935**	0.0596	-0.6779**	0.0246	-0.6217**	0.0371
Nat.U.S. citizen	0.2100**	0.0258	0.2661**	0.0340	-0.3033**	0.0198	-0.2199**	0.0265
Recent immigrant	0.0254	0.0404	-0.0844	0.0646	-0.1485**	0.0252	0.0671	0.0454
English ability	0.1447**	0.0187	0.0143	0.0261	0.3494**	0.0113	0.4238**	0.0175
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.1324**	0.0226	-0.1464**	0.0357	-0.4119**	0.0215	-0.4278**	0.0348
Age 60+	0.2917**	0.0152	0.1881**	0.0208	0.2760**	0.0242	0.3242**	0.0284
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.5330**	0.0289	-0.5945**	0.0501	-0.3877**	0.0283	-0.4728**	0.0407
Other family	-0.2840**	0.0134	-0.3573**	0.0190	0.1879**	0.0168	0.1027**	0.0226
Recent mover	0.2632**	0.0139	0.0013	0.0300	0.3096**	0.0164	0.2788**	0.0322
Constant	-1.5978**	0.0663	-0.3176**	0.0891	-4.1938**	0.0790	-3.6755**	0.0942
Constant (centered)	1.2849**	0.0146	1.4195**	0.0202	-0.8236**	0.0179	-0.9083**	0.0230

Note: * = p<0.05, ** = p<0.01

Table 15. Fractional Logit Regressions for Dissimilarity Index Attainment Analyses for San Diego CA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.3988**	0.0088	0.2450**	0.0100	0.3945**	0.0152	0.2327**	0.0171
Income (Ln)	0.1320**	0.0067	0.0959**	0.0082	0.1032**	0.0158	0.0556**	0.0155
Military	-0.5260**	0.0218	-0.5743**	0.0351	-0.0680	0.0491	0.1888**	0.0717
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	0.3020**	0.0897	0.1521	0.1224	-0.6992**	0.0596	-0.6284**	0.0776
Nat.U.S. citizen	0.2274**	0.0541	0.3175**	0.0760	-0.5666**	0.0494	-0.5728**	0.0619
Recent immigrant	-0.0769	0.1011	0.0095	0.1323	-0.1650**	0.0635	-0.0212	0.0930
English ability	0.2111**	0.0456	0.3749**	0.0627	0.3676**	0.0307	0.4114**	0.0380
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.2827**	0.0300	-0.2948**	0.0488	-0.2708**	0.0473	-0.1269	0.0672
Age 60+	0.5153**	0.0245	0.4731**	0.0334	0.2663**	0.0577	0.4147**	0.0629
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.6193**	0.0435	-0.7052**	0.0752	-0.3898**	0.0650	-0.6248**	0.0919
Other family	-0.2302**	0.0209	-0.2716**	0.0303	0.3899**	0.0398	0.0850	0.0497
Recent mover	-0.0188	0.0212	0.0034	0.0439	0.0751	0.0401	0.2329**	0.0642
Constant	-1.5603**	0.1523	-1.3556**	0.2062	-3.5349**	0.1805	-2.7930**	0.1860
Constant (centered)	1.1842**	0.0236	1.2115**	0.0307	-0.6159**	0.0434	-0.5411**	0.0507

Note: * = p<0.05, ** = p<0.01

Table 16. Fractional Logit Regressions for Dissimilarity Index Attainment Analyses for Seattle WA

	Whites				Latinos			
	2000		2010		2000		2010	
Variable	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**	**Coefficient**	**S.E.**
Degree	0.1623**	0.0062	0.1508**	0.0073	0.1882**	0.0305	0.1946**	0.0287
Income (Ln)	0.1235**	0.0056	0.0785**	0.0065	0.2153**	0.0416	0.0484	0.0282
Military	-0.2742**	0.0164	-0.3352**	0.0267	-0.2422*	0.1002	-0.2186	0.1238
U.S.-born citizen (ref)	---	---	---	---	---	---	---	---
Non-U.S. citizen	0.0035	0.0611	0.0367	0.0852	-0.2115	0.1408	-0.7442**	0.1461
Nat.U.S. citizen	-0.0138	0.0412	0.0584	0.0579	-0.0672	0.1131	-0.2649*	0.1260
Recent immigrant	-0.4328**	0.0682	-0.3507**	0.0897	-0.2574	0.1348	-0.0294	0.1452
English ability	0.1973**	0.0338	0.3804**	0.0468	0.3169**	0.0705	0.3859**	0.0829
Age 30-59 (ref)	---	---	---	---	---	---	---	---
Age 15-29	-0.5048**	0.0209	-0.5252**	0.0335	-0.2640**	0.0932	-0.4378**	0.1112
Age 60+	0.4263**	0.0184	0.5296**	0.0240	0.4932**	0.1382	0.3161*	0.1288
Married couple (ref)	---	---	---	---	---	---	---	---
Single mother	-0.5747**	0.0305	-0.6970**	0.0487	-0.4490**	0.1436	-0.3611*	0.1481
Other family	-0.5619**	0.0145	-0.5226**	0.0208	-0.3197**	0.0814	-0.3348**	0.0888
Recent mover	-0.3180**	0.0147	-0.3080**	0.0296	-0.1924*	0.0836	-0.0345	0.1034
Constant	-1.0566**	0.1144	-1.3165**	0.1523	-4.1484**	0.4758	-2.2164**	0.3583
Constant (centered)	1.1017**	0.0160	0.9191**	0.0209	-0.6556**	0.0904	-0.1809*	0.0867

Note: * = $p<0.05$, ** = $p<0.01$

The difference between D and S in responding to changes in residential distributions bears further comment. The residential attainments that determine S are measured on a continuous scale while those that determine D are measured as a dichotomy of the same scores. This accounts for a well-known technical difference between S and D; S responds to any residential change that promotes greater or lesser integration while D does not (Zoloth 1976; James and Taeuber 1985; Reardon and Firebaugh 2002). As a result, D and S can easily move in different directions when residential distributions change (Stearns and Logan 1986). A common pattern observed for White-Latino segregation is that D declines while S increases or holds steady as the Latino population grows in an area.

This is seen in Seattle and involves the following pattern. In 2000, D is at 45.26 and is much higher than S at 8.38. The "high D, low S" combination signals what Fossett (2014) terms "displacement without group separation" wherein Latinos disproportionately live in areas that fall short of parity on area proportion White, but nevertheless live in areas that are predominantly White, not predominantly Latino. Under these conditions, an influx of Latino immigrants and migrants will raise S if they tend to locate in predominantly Latino areas but at the same time can produce a decline in D because proportion White for the city declines and elevates many Latinos in predominantly White neighborhoods to parity on proportion White. This pattern is not just a logical curiosity. It is empirically typical for in Latino New Destination areas (Fossett, Fox, Saenz, and Zhang 2014).

The takeaway point then is that interpreting changes in D is more complicated than interpreting changes in S. D is sensitive to changes in residential outcomes over a very narrow range of area proportion White and insensitive other potentially important changes in neighborhood composition. In contrast, S responds to changes throughout the full range of area proportion White. So, for example, in cities like Seattle, it is logically possible, and indeed quite easy, to rearrange Latinos who are residing in areas that fall short of parity on area proportion White to create more predominantly Latino areas (emerging barrios) leaving D unchanged even as S rises significantly. In such cases, S will tell an important story that D misses. Other patterns are not as stable across cities, which could again be a reflection of the nature of the Dissimilarity Index. The effect of military behaves as expected in Houston and Chicago, predicting that Whites who have had military experience are less likely to live in blocks where Whites are overrepresented and Latinos who have had military experience are more likely to have the same outcome. However, the effect is not significant in Atlanta, Los Angeles and San Diego. In Seattle, the effect is opposite with Latinos who have had military experience also being less likely to live in blocks where Whites are overrepresented. Here again is an example of how the way in which the Dissimilarity Index is calculated can play a role – because the proportion White in Seattle is high, the effect of military experience for Latinos is negative due to the fact that integration means that Latinos live in neighborhoods where Whites are underrepresented relative to the city proportion White.

Changes over time once again suggest that the effects of socioeconomic status are weaker in 2010 than they were in 2000. However, as pointed out previously, this could have more to do with the change in sample size and lesser reliability in 2010 as compared to the data available in 2000. In contrast, the effects of acculturation for Latinos have remained relatively stable in most cities, with some volatility in cities with smaller Latino populations such as Seattle and Atlanta. Thus it can be said that while socioeconomic status appears to have less of an effect on residential outcomes in 2010, the effects are still significant and positive and acculturation effects continue to matter, which means that spatial assimilation dynamics are still operating in 2010 as they were in 2000. Any departures in 2010 from the findings in 2000 could have as much to do with changes in sample size or city ethnic composition than with sociologically meaningful changes in residential mobility patterns.

While the findings for the Dissimilarity Index are less consistent and less stable across cities and over time, in general they do agree with findings based on the Separation Index. Spatial assimilation theory is supported by the results produced in the micro-models and in general, the effect of socioeconomic status is stronger for Latinos than for Whites because of the fact that Whites already live in majority White neighborhoods while Latino residential outcomes are more varied. There is little more than can be learned from modeling the segregation relevant outcome for the Dissimilarity Index that hasn't already been found by modeling the outcome for the Separation Index, and so modeling the Dissimilarity Index is simply to show that what was found using the Separation Index, a less popular measure of evenness, is confirmed

by using the more well-known Dissimilarity Index. For cross-area comparisons, the Dissimilarity Index is not as ideal to the issues mentioned previously, specifically the fact that outcomes on the Dissimilarity Index are dependent on the city's ethnic composition. But to some extent these models based on the Dissimilarity Index are useful so long as knowledge about each area's demographics is kept in mind when drawing out interpretations.

Summary

In this first analysis chapter I have explored the micro-level factors that determine segregation patterns based on both the Separation Index and the Dissimilarity Index. These attainment models are highly useful for analyzing the independent effects that individual level factors have on residential attainments and mobility. For the most part, everything that I found in these analyses is in line with the spatial assimilation framework. For Latinos, socioeconomic status and acculturation are positive predictors of residential contact with Whites, with the understanding that increased residential contact with Whites implies a move towards integration. There were some nuances to take into account, however, with the first being that the strength of the effects appears to rely on the ethnic composition of the city. This is especially pronounced when modeling the Dissimilarity Index, but it can also be observed in the models based on the Separation Index. A key example of this descriptive finding is Seattle, where the proportion White in the city is very high and thus both Whites and Latinos are already living in predominately White neighborhoods. In this situation, the effects of

socioeconomic status and acculturation matter less because both groups are already experiencing high neighborhood contact with Whites.

In contrast, in cities like Los Angeles, Houston, and Chicago where the Latino population is large and predominately Latino neighborhoods have formed, socioeconomic status and acculturation are much stronger predictors of residential mobility because Latinos in general have less residential contact with Whites. These are cities with higher levels of segregation and larger immigrant populations who are more socially distant from U.S.-born Whites, and so the variation in residential outcomes for Latinos is much greater. However, even though the effects appear to be stronger in more ethnically diverse cities, they are still significant and positive predictors in every city including Seattle. The question of cross-area variation will be explored in detail in Chapter 6.

The last note that I make in this chapter is that the analyses presented here make a methodological contribution which will be further demonstrated in the following analysis chapters. The ability to reformulate popular measures of segregation such as the Dissimilarity Index into a "difference of means" format where the measure is calculated from individual scores allows for these micro-models to be conducted where the effects of individual level outcomes on overall segregation patterns can be modeled in a statistically appropriate way. This is the first time that these effects have been directly modeled and this method opens the door to more comprehensive understandings of how segregation is driven by micro-level social processes. The story that is told by spatial assimilation theory can be modeled and analyzed using these new measures and

methods. In addition, more can be done to explore questions regarding the mechanisms by which these individual level effects drive segregation patterns by using standardization techniques to generate predicted measures of segregation that are based on manipulating the micro-level factors. This is the task that I will undertake in the next chapter, using the models presented in this chapter and standardization techniques to explore the individual impacts that selected variables have on overall White-Latino segregation outcomes.

CHAPTER V

STANDARDIZATION AND COMPONENTS ANALYSIS

Overview

In this next phase of the analysis I explore the findings from the micro-models presented in Chapter 4 in more detailed ways in order to gain better understandings of the micro-level factors that impact segregation patterns. Now that the coefficients from the micro-models have been estimated, methods of standardization can be applied to see how segregation patterns would change under particular situations. The first step in this endeavor is to produce the observed level of segregation based on predicted values from the models under observed group-specific attainment equations and observed group-specific means. Next I examine the level of segregation expected based on the predicted values at the regression constant when the model is estimated with independent variables centered on a meaningful set of values. Following that, I will conduct the standardization analysis and present the predicted values for the group-specific attainment terms that are used to calculate the Separation Index and the Dissimilarity Index based on when Latinos are given the White means on the independent variables and then also when Latinos have been given the White rates of return. This exercise will provide insight into how segregation would change when not only differences in group characteristics are eliminated, but also when differences in the ability to convert those characteristics into residential contact with Whites are eliminated as well.

The second step in this part of the analysis that I undertake is to decompose the observed level of segregation for each city into to the separate contributions that can be attributed to the group differences in means and the group differences in rates of return in order to quantitatively assess the role that each plays in the overall segregation outcome. Components analysis is a very useful tool for understanding the separate impacts that group disparities in social characteristics and rates of return have on segregation and also for understanding what makes the larger contribution to group differences in residential outcomes. Note that the analysis also will yield a "joint" or "interaction" term that represents the portion of segregation that results due to the difference in group means and difference in group rates of return occurring simultaneously. Substantively, this can be understood as (a) the difference between the impact of equalizing group rates *after instead of before* equalizing group differences in means, or (b) the difference between the impact of equalizing group means *after instead of before* equalizing group differences in rates.

In the final analysis section of this chapter, I will analyze the impact that specific independent variables have on segregation outcomes for each of the six case studies. The variables that I will focus on are education, income, and the combination of citizenship and nativity. The goal of this analysis is to hold all other independent variables at certain values and only manipulate the variable of interest in order to see how changing a single characteristic affects the predicted neighborhood outcome. For instance, in analyzing the impact of education, all other variables for Whites and Latinos will be set to specific values to create a reference "profile" and I will generate model-

based predicted values at two comparison points: when Whites and Latinos are set to have a high school diploma and when they are set to have a post-graduate degree. Similar practices will be carried out for assessing the impact of income and citizenship and nativity.

There are two objectives in this chapter. The first is to draw substantive conclusions about the individual effects that variables related to spatial assimilation theory have on segregation patterns and how disparities in rates of return play a role. This accomplished with standardization and components analysis which has not so far been applied to segregation analysis in the literature. This is the basis for the second objective which is to show how these methods are useful and informative tools for gaining a deeper understanding of the micro-level social processes that drive segregation outcomes.

Predicted Values on Non-Centered and Centered Constants

In this first section I review the predicted values for segregation-relevant residential outcomes for Whites and Latinos as generated from the micro-models presented in Chapter 4. There are two variations on these predicted values. The first are the "baseline" predicted group means for residential outcomes based on the observed group-specific means and the estimated group-specific regression coefficients. In ordinary least squares regression, these group-specific predictions will necessarily *exactly* reproduce the observed group means on segregation-relevant residential outcomes which in turn will *exactly* reproduce the observed segregation index score for the city (Althauser and Wigler 1975; Jones and Kelley 1986). In the present case, the

predictions do not necessarily exactly reproduce the observed group means on the segregation-relevant outcomes due to the nonlinear nature of the fractional logit modeling technique. However, if the effects of the independent variables are specified appropriately, the predicted group means will be near exact.

The second variation is the predicted outcomes when selected variables have been centered on specified values as discussed in Chapter 3. To review these specifications, the constant is estimated with education centered on high school diploma, income on the mean income for Whites who have completed a high school diploma, and English language ability on speaking only English or speaking English very well. The purpose for centering these variables on specific values is to generate a constant with a meaningful value – the constant represents the mean outcome for an individual with all of the specifications mentioned in addition to being in the reference category for other independent variables; that is, being non-military, U.S.-born, age 30-59 and in a married couple household.[8] The comparison of the constants from the White and Latino equations can be understood as indicating a relatively pure "race" effect because it represents the group difference in expected segregation-relevant residential outcomes for a "typical" householder with the combination of characteristics used in centering the independent variables. In Table 17 these predicted values are presented for all six cities at both points in time as well as the observed values in order to demonstrate how well fractional logit models the means of proportions.

[8] In contrast, the constant for the uncentered versions of the variables would be less meaningful because it would be the predicted outcome for a householder with the unusual combination of characteristics of being non-military, U.S. born, 30-59, and in a married-couple household but with no income, no education, and no English language ability.

Table 17. Observed, Model-Predicted, and Centered Predicted Segregation Index Scores

	Separation Index			Dissimilarity Index		
	Observed	Model-Predicted	Centered	Observed	Model-Predicted	Centered
Atlanta						
2000	27.18	23.94	14.93	56.96	63.08	43.71
2010	30.58	29.61	16.25	53.02	59.13	35.81
Chicago						
2000	40.83	40.37	34.37	63.35	68.64	56.31
2010	39.51	39.85	31.37	58.46	63.27	50.31
Houston						
2000	41.09	42.09	30.82	58.48	65.69	47.53
2010	40.60	42.28	30.38	56.04	62.79	45.03
Los Angeles						
2000	49.60	51.70	34.13	64.16	70.89	47.83
2010	47.95	50.39	36.71	62.33	68.56	51.79
San Diego						
2000	34.14	34.36	23.54	54.22	61.01	41.50
2010	33.63	34.21	24.49	50.91	56.11	40.26
Seattle						
2000	9.30	8.38	6.24	45.26	47.78	40.88
2010	11.89	11.28	6.54	37.60	42.31	26.00

The "baseline" predicted values closely mirror the descriptive results presented in Chapter 4 and so will not be reviewed again. The near-exact replication of the group means presented in Chapter 4 provides strong evidence that the specification of the effects of the independent variables is satisfactory for the purposes of standardization

and decomposition analyses presented in this chapter. The next key finding to focus on is how the scores change when the constant is centered on meaningful values which is the essentially the first step into understanding how standardization techniques can show the ways in which segregation dynamics behave. With the constant adjusted to represent a battery of social characteristics conducive to lower segregation, the predicted values generated are much lower as a result. To clarify, these predicted values do not represent the observed patterns occurring in these cities as the non-centered values do. But there is some insight to be gained about the relationship between the independent variables and the outcome by centering the constant on a meaningful combination of social and economic characteristics.

Standardization on Group Means and Rates of Return – Separation Index

In this next section I review the standardization results based on the Separation Index, where the group specific predictions are generated by first applying the White means on the independent variables to the Latino equation and then the White rates of return to the Latino equation to see how the segregation outcome changes in each city based on these manipulations. The results are presented in Table 18 for the six case studies in both the 2000 and 2010.

Table 18. Standardization Analysis for Separation Index

		Predicted Contact with Whites					
Year	Comparison	Atlanta	Chicago	Houston	Los Angeles	San Diego	Seattle
2000	with Latino Group Means & Latino Rates of Return	72.21	52.20	43.15	30.51	52.29	88.02
	with White Group Means & Latino Rates of Return	86.88	66.87	62.85	54.13	69.56	91.66
	with Latino Means & White Rates of Return	91.42	87.02	74.08	71.69	81.34	94.96
	with White Group Means & White Rates of Return	96.14	92.57	85.25	82.21	86.64	96.40
2010	with Latino Group Means & Latino Rates of Return	63.08	49.52	36.78	27.39	47.75	82.45
	with White Group Means & Latino Rates of Return	80.88	63.05	54.54	46.37	61.89	88.65
	with Latino Group Means & White Rates of Return	85.94	84.15	67.35	72.48	76.69	90.81
	with White Group Means & White Rates of Return	92.69	89.36	79.07	77.78	81.95	93.73

A clear pattern emerges from this first set of standardization results as Latino residential outcomes transition from being based on equations where the Latino means and Latino rates of return are applied to equations where the White means and White rates of return are applied. Applying the White means on social characteristics raises Latino average contact with Whites notably in most cities. In 2000, applying the White means to the Latino equations raised Latino contact with Whites 14 points in Atlanta, 13 points in Chicago, 19 points in Houston, 14 points in Los Angeles, 17 points in San Diego and 3 points in Seattle. In all cases except for Seattle, where Latino contact with Whites was already high at 88 points, these increases suggest that differences in social characteristics make an important contribution to residential segregation between Whites and Latinos.

However, the even larger changes are seen when the White rates of return are applied in combination with the Latino means on the independent variables. In every city, the effect of replacing the Latino rates of return with the White rates of return is large in magnitude. It is clear that the disparities in rates of return to social and economic characteristics play a non-negligible role in producing overall segregation patterns based on the Separation Index. There is a caveat here which is that it is over-simplistic to say that the differences in rates of return and in the group means operate independently of one another, which is addressed in the components analysis in a later section of this chapter. However, the role of the difference in rates of return cannot be ignored as appears to be a large determinant of the disparities in residential outcomes between Whites and Latinos. As with the previous chapter, the results based on the

more widely used Dissimilarity Index will be discussed next in order to verify that this is a finding confirmed by multiple measures of evenness.

Standardization on Group Means and Rates of Return – Dissimilarity Index

In the Table 19, the standardization analysis results based on the Dissimilarity Index for the six case studies in 2000 and 2010 are presented. In general the results based on the Dissimilarity Index agree with what was found based on the Separation Index, though the changes in segregation are more dramatic due to the nature of the measure as discussed previously. In all cities, applying the White means to the Latino equation raises the proportion of Latinos who live in blocks where Whites are overrepresented by a large amount which would imply that segregation would be much lower as a result. But again the largest change happens when the White rates of return are applied to the Latino equations will retaining the Latino means on the independent variables, suggesting that it is the disparity in the ability to convert socioeconomic gains and acculturation into residential mobility that contributes the most to segregation. It should again be noted that in cases such as Seattle where segregation is relatively lower, the changes are less dramatic though still large when using the Dissimilarity Index due to the fact that the measure can overreact to small changes.

Table 19. Standardization Analysis for Dissimilarity Index

		Predicted Contact with Whites					
Year	Comparison	Atlanta	Chicago	Houston	Los Angeles	San Diego	Seattle
2000	with Latino Group Means & Latino Rates of Return	19.75	17.41	19.17	16.23	22.01	35.16
	with White Group Means & Latino Rates of Return	50.67	43.36	52.27	49.74	51.84	43.58
	with Latino Group Means & White Rates of Return	60.59	71.14	64.76	73.33	71.71	58.76
	with White Group Means & White Rates of Return	82.82	86.05	84.87	87.12	83.02	67.53
2010	with Latino Group Means & Latino Rates of Return	23.52	20.31	21.15	17.03	25.64	28.50
	with White Group Means & Latino Rates of Return	55.03	41.19	49.14	43.18	49.05	47.66
	with Latino Group Means & White Rates of Return	61.88	71.71	65.87	79.79	72.00	56.06
	with White Group Means & White Rates of Return	82.65	83.58	83.93	85.59	81.76	70.81

To summarize the results from the standardization analysis, this exercise is one useful way to understand the components at the micro-level that determine segregation outcomes. The pattern is clear and unsurprising: equalizing Whites and Latinos on social characteristics decreases residential separation to some extent, but equalizing them on rates of return has an even larger impact on reducing segregation. These results thus provide a clear indication that there is more to the story than just spatial assimilation dynamics. If differences in characteristics such as socioeconomic status, nativity, and citizenship were all that are driving segregation, then that would be the only thing that the standardization analysis would reveal. However, the disparity in the rates of return between Whites and Latinos makes the story more complex. The ability of Latinos to convert socioeconomic gains and acculturation into greater contact with Whites is not equal with that of Whites and this requires further exploration. Components analysis can adequately summarize the impact that differences in group means and differences in group rates of return have on overall segregation outcomes and will now be reviewed in the next section.

Components Analysis

Components analysis, as described in Chapter 3, is a useful tool for gaining insight into how an overall group difference in a particular outcome comes to be. In the previous section, it was evident that there were two factors that made large contributions to White-Latino differences in residential outcomes: differences in group means on the micro-level factors that predict segregation and differences in group rates of return on those factors. In other words, in the context of the micro-models discussed in Chapter 4

these are the group differences in the means on the independent variables and the group differences in the coefficients. For each of the six case study cities at both time points, the predicted values of the Separation Index and the Dissimilarity Index are decomposed down to the contributes made by the White-Latino differences in group means and rates of returns. There is a moderating factor which can be thought of as the joint impact of both disparities and is also included in the calculation that produces the final segregation score. I will begin by reviewing the component analysis results based on the Separation Index and follow with the results for the Dissimilarity Index. The component analysis results for each city based on the Separation Index are presented in Table 20.

Table 20. Components Analysis for Separation Index

		Contribution to Index Score					
Year	Component	Atlanta	Chicago	Houston	Los Angeles	San Diego	Seattle
2000	Group Means	14.67	14.67	19.70	23.62	17.28	3.64
	Group Rates of Return	19.21	34.82	30.93	41.19	29.05	6.94
	Joint Impact	-9.95	-9.12	-8.53	-13.11	-11.97	-2.20
	Total Difference	23.94	40.37	42.09	51.70	34.36	8.38
2010	Group Means	17.80	13.54	17.76	18.97	14.15	6.20
	Group Rates of Return	22.86	34.63	30.57	45.09	28.95	8.36
	Joint Impact	-11.05	-8.32	-6.04	-13.67	-8.89	-3.28
	Total Difference	29.61	39.85	42.28	50.39	34.21	11.28

The components analysis results summarize the implications of the standardization exercises presented in the previous section. In each table, the contributions made by the difference in group means, the difference in group rates of return, and the joint impact of both are shown as summing up to the predicted segregation score for the city. The pattern is consistent across areas and over time, which is that the largest component is made by the difference in rates of return in comparison to the difference in group means. This is less of a contrast in low segregation cities such as Atlanta and Seattle, but the contrast is quite notable in Chicago, Houston, and Los Angeles where segregation is high and the proportion Latino is large.

The finding that the largest contribution to segregation is the White-Latino difference in rates of return does not downplay the role of the White-Latino differences in means for social and economic characteristics. In every city where segregation is high, the role of disparities in social characteristics which include socioeconomic status, citizenship and English language ability is not trivial. This is especially the case in Houston and Los Angeles where the contribution made by the difference in group means is nearly half of the overall score based on the Separation Index. The next task is to once again review these same outputs based on the Dissimilarity Index in order to strengthen the interpretations made based on the Separation Index. The components analysis results based on the Dissimilarity Index are presented in Table 21 below.

Table 21. Components Analysis for Dissimilarity Index

		Contribution to Index Score					
Year	Component	Atlanta	Chicago	Houston	Los Angeles	San Diego	Seattle
2000	Group Means	30.92	25.95	33.10	33.51	29.83	13.23
	Group Rates of Return	40.84	53.73	45.58	57.10	49.70	34.72
	Joint Impact	-8.69	-11.03	-12.99	-19.72	-18.52	-0.18
	Total Difference	63.08	68.64	65.69	70.89	61.01	47.78
2010	Group Means	31.51	20.88	27.99	26.15	23.41	19.16
	Group Rates of Return	38.36	51.41	44.72	62.76	46.36	27.56
	Joint Impact	-10.74	-9.01	-9.93	-20.35	-13.65	-4.41
	Total Difference	59.13	63.27	62.79	68.56	56.11	42.31

The patterns based on these results are once again consistent with the findings based on the Separation Index. Overall, the White-Latino differences in the rates of return make the largest contribution to the overall differences in the proportions of each group who live in blocks where Whites are overrepresented relative to the city proportion White. This is true across all cities and time points, including Atlanta and Seattle where White-Latino segregation is lower. In cities where segregation as measured by the Dissimilarity Index is staying stable over time such as Houston, Los Angeles and San Diego, there is a slight observable decrease in the role of group differences in social characteristics accompanied by a slight increase in the role of group differences in rates of return. Whether this is a sociologically meaningful pattern or merely an artifact of the different samples involved in each time-specific analysis is open for speculation, though the pattern is consistent across these particular types of cities.

Standardization on Profiles

The final exercise in this chapter is to generate predicted values from the micro-model equations when the independent variables are set to specific values and then review the changes in the predicted mean for segregation-relevant residential outcomes when only a single predictor is manipulated. The default "profile" that both the Latino and the White equations are set to is an individual who has a high school diploma or equivalent, a household income of $40,000, has not served in the military, is US-born, speaks English exclusively or very well, is age 30-59, lives in a married couple household, and is not a recent mover. When both group equations are set to these values, the predicted scores are as shown in Tables 22 and 23 below. The predictions

when all independent variables are set to the values for the default profile reveal lower segregation outcomes than what the outcomes predicted at the mean are, which is to be expected because the difference in group means on the independent variables have been eliminated and both groups have been given a set of characteristics that would be conducive to greater integration. For instance, for Latinos acculturation is an important predictor of residential outcomes, but in this example Latinos are the independent variables are set so that the prediction for Latinos is based on Latinos being U.S.-born and English-speaking. Therefore the predicted values are not being drawn down by the presence of foreign-born or non-English-speaking individuals.

Table 22. Predictions on the Separation Index at Default "Profile"

Group	2000	2010	Group	2000	2010
Atlanta			**Los Angeles**		
Whites	96.91	93.61	Whites	77.14	74.38
Latinos	82.88	77.66	Latinos	43.24	37.60
Separation Index	14.03	15.95	Separation Index	33.90	36.78
Chicago			**San Diego**		
Whites	92.21	89.04	Whites	84.43	80.28
Latinos	58.60	57.97	Latinos	61.08	55.93
Separation Index	33.61	31.07	Separation Index	23.35	24.35
Houston			**Seattle**		
Whites	83.90	78.34	Whites	96.85	93.96
Latinos	53.40	48.07	Latinos	90.66	87.43
Separation Index	30.50	30.27	Separation Index	6.19	6.53

Table 23. Predictions on the Dissimilarity Index at Default "Profile"

Group	2000	2010	Group	2000	2010
Atlanta			**Los Angeles**		
Whites	87.15	85.01	Whites	80.07	81.64
Latinos	44.27	49.53	Latinos	32.52	29.77
Dissimilarity Index	42.88	35.48	Dissimilarity Index	47.55	51.87
Chicago			**San Diego**		
Whites	84.66	82.25	Whites	78.07	78.17
Latinos	29.33	31.97	Latinos	36.61	37.66
Dissimilarity Index	55.33	50.28	Dissimilarity Index	41.46	40.51
Houston			**Seattle**		
Whites	80.86	82.48	Whites	76.30	72.28
Latinos	33.66	37.42	Latinos	36.84	46.10
Dissimilarity Index	47.20	45.06	Dissimilarity Index	39.46	26.18

With the baseline predictions estimated, I next assess how the predictions change when values on selected independent variables are manipulated, beginning with educational attainment. In this exercise, all other independent variables remain set to the values outlined in the baseline profile and education is alternated between the baseline value of having a high school diploma or equivalent and the value of having a post-graduate degree. Below in Table 24, the predictions for all six case studies at both points in time are presented for the Separation Index and in Table 25 they are presented for the Dissimilarity Index. The group-specific means that are used to calculate the index are also provided in the tables so that it is possible to also calculate the index when one group is set to have a high school diploma or equivalent while the other group has a post-graduate degree, though only the indices when the groups are equalized on education level are calculated and displayed in the table.

Table 24. Predictions on the Separation Index at Two Levels of Education

	2000		2010	
Group	High School Diploma	Post Graduate Degree	High School Diploma	Post Graduate Degree
Atlanta				
Whites	96.91	97.26	93.61	94.32
Latinos	82.88	90.87	77.66	84.75
Separation Index	14.03	6.39	15.95	9.57
Chicago				
Whites	92.21	95.31	89.04	92.42
Latinos	58.60	71.96	57.97	69.75
Separation Index	33.61	23.35	31.07	22.67
Houston				
Whites	83.90	90.23	78.34	84.61
Latinos	53.40	72.60	48.07	64.81
Separation Index	30.50	17.63	30.27	19.80
Los Angeles				
Whites	77.15	88.14	74.38	82.30
Latinos	43.24	63.72	37.60	54.56
Separation Index	33.91	24.42	36.78	27.74
San Diego				
Whites	84.43	91.30	80.28	85.67
Latinos	61.08	75.51	55.93	65.59
Separation Index	23.35	15.79	24.35	20.08
Seattle				
Whites	96.85	97.77	93.96	95.40
Latinos	90.66	93.93	87.43	91.03
Separation Index	6.19	3.84	6.53	4.37

Table 25. Predictions on the Dissimilarity Index at Two Levels of Education

	2000		2010	
Group	High School Diploma	Post Graduate Degree	High School Diploma	Post Graduate Degree
Atlanta				
Whites	87.15	89.14	85.01	88.00
Latinos	44.27	65.99	49.53	64.76
Dissimilarity Index	42.88	23.15	35.48	23.24
Chicago				
Whites	84.66	92.29	82.25	89.00
Latinos	29.33	54.85	31.97	52.81
Dissimilarity Index	55.33	37.44	50.28	36.19
Houston				
Whites	80.86	92.37	82.48	91.29
Latinos	33.66	69.75	37.42	65.48
Dissimilarity Index	47.20	22.62	45.06	25.81
Los Angeles				
Whites	80.07	93.44	81.64	90.98
Latinos	32.52	65.00	29.77	55.47
Dissimilarity Index	47.55	28.44	51.87	35.51
San Diego				
Whites	78.07	92.17	78.17	88.19
Latinos	36.61	65.35	37.66	54.84
Dissimilarity Index	41.46	26.82	40.51	33.35
Seattle				
Whites	76.30	83.97	72.28	80.39
Latinos	36.84	50.64	46.10	60.52
Dissimilarity Index	39.46	33.33	26.18	19.87

The first finding is that segregation is always lower and at times much lower when Whites and Latinos are equalized on having post-graduate degrees as compared to being equalized on having high school diplomas or equivalents. This suggests that at the higher end of the socioeconomic spectrum, Whites and Latinos tend to be less residentially separated. The second main finding from this first exercise is that the changes in predicted segregation are in large part due to how Latino outcomes change by education level. For example, in the results for the Separation Index, the mean block-level proportion White for Latinos increases by nearly 20 points in Houston and Los Angeles as Latinos move from a high school diploma or equivalent to a post-graduate degree, while the outcomes for Whites increase at a smaller magnitude. This reflects the findings from Chapter 4, where it was often the case that the effect of education was much stronger for Latinos.

In the second exercise in this section, I hold all variables on the values outlined above except for income, which is first set at $15,000 and then set at $90,000. Income was another strong predictor in the models discussed in Chapter 4, though its effects were often not as strong as the effects of education. However, income and education do not operate independently and so that is important to bear in mind. Another thing that must be noted is that unlike education, the effect of income is much more variable across areas due to a wide range of cost of living which complicates making comparisons across cities. For instance, a household income of $90,000 can afford a higher quality of living in Houston than it can in Los Angeles. With those cautions in mind, the predictions for this standardization analysis are presented in Tables 26 and 27.

Table 26. Predictions on the Separation Index at Two Levels of Income

	2000		2010	
Group	$15K	$90K	$15K	$90K
Atlanta				
Whites	96.70	97.08	93.39	93.78
Latinos	81.96	83.60	76.98	78.21
Separation Index	14.74	13.48	16.41	15.57
Chicago				
Whites	91.32	92.88	88.41	89.53
Latinos	56.24	60.51	56.81	58.92
Separation Index	35.08	32.37	31.60	30.61
Houston				
Whites	82.52	84.96	77.20	79.24
Latinos	51.49	54.95	46.75	49.15
Separation Index	31.03	30.01	30.45	30.09
Los Angeles				
Whites	75.25	78.62	73.05	75.43
Latinos	41.03	45.07	36.42	38.58
Separation Index	34.22	33.55	36.63	36.85
San Diego				
Whites	83.39	85.25	79.45	80.03
Latinos	59.77	62.13	54.89	56.79
Separation Index	23.62	23.12	24.56	23.24
Seattle				
Whites	96.61	97.03	93.65	94.20
Latinos	90.34	90.92	87.10	87.70
Separation Index	6.27	6.11	6.55	6.50

Table 27. Predictions on the Dissimilarity Index at Two Levels of Income

	2000		2010	
Group	$15K	$90K	$15K	$90K
Atlanta				
Whites	86.03	88.01	84.39	85.51
Latinos	41.60	46.48	48.41	50.45
Dissimilarity Index	44.43	41.53	35.98	35.06
Chicago				
Whites	82.32	86.39	80.90	83.30
Latinos	25.21	32.98	30.58	33.13
Dissimilarity Index	57.11	53.41	50.32	50.17
Houston				
Whites	78.37	82.73	80.60	83.90
Latinos	30.69	36.19	35.62	38.92
Dissimilarity Index	47.68	46.54	44.98	44.98
Los Angeles				
Whites	77.40	82.07	79.87	83.00
Latinos	29.49	35.11	28.18	31.10
Dissimilarity Index	47.91	46.96	51.69	51.90
San Diego				
Whites	75.75	79.85	76.51	79.47
Latinos	34.27	38.57	36.38	38.72
Dissimilarity Index	41.48	41.28	40.13	40.75
Seattle				
Whites	74.01	78.06	70.70	73.54
Latinos	32.03	40.98	44.91	47.07
Dissimilarity Index	41.98	37.08	25.79	26.47

It is clear in all areas at both time points, based on the Separation Index and the Dissimilarity Index, that manipulating household income while keeping all other variables constant does not make any noteworthy changes to overall segregation scores. In general, Whites and Latinos are just as segregated at a household income of $15,000 as they are at a household income of $90,000. However, when there is change it tends to be towards a decline in segregation which is in agreement with the findings based on education that Whites and Latinos at higher levels of socioeconomic status are less segregated. Also consistent with the findings from manipulating levels of education is that the change in residential contact with Whites from low income to higher income is larger for Latinos than it is for Whites, again highlighting that Latinos are further away from the "ceiling" of living in all White neighborhoods than Whites are with the exception of Seattle where Latinos live in predominately White neighborhoods.

The final exercise in this section is to assess how White-Latino segregation changes at varying levels of nativity and citizenship. Once again all other variables are held to the values specified above, but nativity and citizenship are manipulated on a spectrum from least assimilated to most assimilated There are four categories total: 1) Foreign-born, recent immigrant, non-U.S. citizen, 2) Foreign-born, has been in the U.S. for >15 years, non-U.S. citizen, 3) Foreign-born, naturalized U.S.-citizen, and 4) U.S.-born and U.S. citizen by birthright. For Latinos, these factors were found to be significant predictors of residential contact with Whites in most cases. For Whites, the effects were more varied and often were not strong predictors, and so it is to be expected that the changes in segregation in this exercise will be predominately driven by

manipulating the outcomes for Latinos. The results for this standardization analysis are presented in Tables 28 and 29.

The tendency in all cities and in both time points is for segregation to go down as the groups move from being recent immigrants without U.S.-citizenship to U.S.-born, though there is some variability in between that warrants explanation. In some cases, such as Atlanta, Chicago, Houston, and Seattle in 2000 and 2010 based on both the Separation Index and the Dissimilarity Index, the transition from low assimilation to high assimilation is not accompanied by a steady decline in segregation as would be expected. For example, in San Diego in 2010, the Separation Index first declines from recent immigrant without U.S.-citizenship to non-recent immigrant without U.S.-citizenship, but then increases from foreign-born non-U.S. citizen to foreign-born naturalized U.S.-citizen. Other cities have similar fluctuations that may seem counter-intuitive based on what spatial assimilation theory would predict. However, in some instances these nuanced categories are based on small populations. This makes the minute changes and fluctuations between categories less important for the overall story.

Table 28. Predictions on the Separation Index at Four Levels of Nativity and Citizenship

	2000				2010			
Group	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen
Atlanta								
Whites	93.99	95.95	96.03	96.91	90.00	91.39	90.76	93.61
Latinos	72.88	77.65	82.54	82.88	64.42	71.46	76.80	77.66
Separation Index	21.11	18.30	13.49	14.03	25.58	19.93	13.96	15.95
Chicago								
Whites	88.60	90.19	91.60	92.21	85.63	86.47	88.24	89.04
Latinos	51.64	54.01	58.17	58.60	52.61	51.40	56.09	57.97
Separation Index	36.96	36.18	33.43	33.61	33.02	35.07	32.15	31.07
Houston								
Whites	79.73	82.53	82.52	83.90	75.22	76.82	76.03	78.34
Latinos	42.51	47.14	52.61	53.40	42.23	42.34	47.37	48.07
Separation Index	37.22	35.39	29.91	30.50	32.99	34.48	28.66	30.27

Table 28 (continued)

	2000				2010			
Group	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen
Los Angeles								
Whites	76.67	76.73	79.56	77.15	74.69	75.88	77.67	74.38
Latinos	31.55	32.79	38.14	43.24	29.86	28.49	33.57	37.60
Separation Index	45.12	43.94	41.42	33.91	44.83	47.39	44.10	36.78
San Diego								
Whites	84.97	85.83	85.72	84.43	81.21	81.02	82.57	80.28
Latinos	49.38	50.70	52.66	61.08	46.90	48.06	47.32	55.93
Separation Index	35.59	35.13	33.06	23.35	34.31	32.96	35.25	24.35
Seattle								
Whites	95.98	96.87	96.87	96.85	92.45	93.84	93.99	93.96
Latinos	86.26	86.81	88.90	90.66	79.24	81.45	84.02	87.43
Separation Index	9.72	10.06	7.97	6.19	13.21	12.39	9.97	6.53

Table 29. Predictions on the Dissimilarity Index at Four Levels of Nativity and Citizenship

	2000				2010			
Group	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen
Atlanta								
Whites	73.97	84.13	83.48	87.15	71.19	80.75	79.84	85.01
Latinos	25.59	31.22	40.87	44.27	28.59	36.26	42.94	49.53
Dissimilarity Index	48.38	52.91	42.61	42.88	42.60	44.49	36.90	35.48
Chicago								
Whites	73.61	79.46	83.11	84.66	73.85	76.76	80.75	82.25
Latinos	17.07	21.51	26.54	29.33	22.26	22.19	29.56	31.97
Dissimilarity Index	56.54	57.95	56.57	55.33	51.59	54.57	51.19	50.28
Houston								
Whites	74.49	79.93	79.31	80.86	80.49	81.92	78.67	82.48
Latinos	19.53	23.28	29.65	33.66	29.20	26.25	34.06	37.42
Dissimilarity Index	54.96	56.65	49.66	47.20	51.29	55.67	44.61	45.06

Table 29 (continued)

	2000				2010			
Group	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen	Foreign-Born, Non-Citizen, Recent Immigrant	Foreign-Born, Non-Citizen	Foreign-Born, Citizen	U.S.-Born Citizen
Los Angeles								
Whites	79.49	79.07	83.21	80.07	83.22	84.37	85.30	81.64
Latinos	17.41	19.65	26.24	32.52	19.57	18.54	25.38	29.77
Dissimilarity Index	62.08	59.42	56.97	47.55	63.65	65.83	59.92	51.87
San Diego								
Whites	81.68	82.80	81.72	78.07	80.80	80.65	83.11	78.17
Latinos	19.57	22.30	24.68	36.61	23.98	24.37	25.41	37.66
Dissimilarity Index	62.11	60.50	57.04	41.46	56.82	56.28	57.70	40.51
Seattle								
Whites	67.69	76.36	76.05	76.30	65.57	73.01	73.43	72.28
Latinos	26.74	32.07	35.29	36.84	28.29	28.89	39.62	46.10
Dissimilarity Index	40.95	44.29	40.76	39.46	37.28	44.12	33.81	26.18

One final analysis that can be done using these techniques is to investigate the changes in segregation outcomes at varying levels of assimilation "profiles" where Whites and Latinos are first set to low scores on social and economic characteristics that would indicate low socioeconomic status and acculturation, followed by middle scores and finally high scores that would represent somebody who has high socioeconomic status and are more acculturated. In the next table, the outcomes for these three profiles are presented across the six cities in 2000 and 2010. The low assimilation "profile" is based on an individual set of characteristics where they have not attended high school, their household income is set to $15,000, they have not served in the military, they are non-citizen recent immigrants, they do not speak English and they are between the ages of 15 and 29. The medium assimilation "profile" is an individual with a completed high school education, a household income of $40,000, they have not served in the military, they are U.S.-born, they speak English exclusively or very well, and they are aged 30 to 59. Finally the high assimilation "profile" is an individual with a post-graduate degree, a household income of $90,000, they have served in the military, they are U.S.-born, they speak English exclusively or very well, and they are aged 60 or older. These profiles and their scores are presented in Tables 30 and 31 below.

Table 30. Predictions on the Separation Index at Three Levels of Assimilation

	2000			2010		
Group	Low	Medium	High	Low	Medium	High
Atlanta						
Whites	74.18	96.91	97.41	62.87	93.61	93.75
Latinos	51.42	67.55	88.11	46.50	52.58	75.04
Separation Index	22.76	29.36	9.30	16.37	41.03	18.71
Chicago						
Whites	57.98	92.21	96.62	60.51	89.04	93.12
Latinos	29.50	51.13	73.49	29.13	44.84	64.50
Separation Index	28.48	41.08	23.13	31.38	44.20	28.62
Houston						
Whites	39.03	83.90	92.11	34.71	78.34	84.62
Latinos	23.27	42.20	66.07	17.63	33.29	54.68
Separation Index	15.76	41.70	26.04	17.08	45.05	29.94
Los Angeles						
Whites	43.91	77.15	90.74	52.75	74.38	83.50
Latinos	14.60	28.83	54.32	11.13	25.00	46.48
Separation Index	29.31	48.32	36.42	41.62	49.38	37.02
San Diego						
Whites	58.84	84.43	92.22	48.25	80.28	85.89
Latinos	34.88	39.80	63.04	30.17	33.24	51.80
Separation Index	23.96	44.63	29.18	18.08	47.04	34.09
Seattle						
Whites	87.12	96.85	97.63	69.44	93.96	95.06
Latinos	78.55	79.76	88.73	57.36	87.43	92.55
Separation Index	8.57	17.09	8.90	12.08	6.53	2.51

Table 31. Predictions on the Dissimilarity Index at Three Levels of Assimilation

	2000			2010		
Group	Low	Medium	High	Low	Medium	High
Atlanta						
Whites	19.41	87.15	89.27	17.69	85.01	86.69
Latinos	1.65	44.27	76.63	2.47	49.53	72.46
Dissimilarity Index	17.76	42.88	12.64	15.22	35.48	14.23
Chicago						
Whites	20.03	84.66	95.33	27.86	82.25	91.65
Latinos	1.02	29.33	80.80	2.06	31.97	69.71
Dissimilarity Index	19.01	55.33	14.53	25.80	50.28	21.94
Houston						
Whites	14.18	80.86	94.80	18.33	82.48	90.63
Latinos	1.49	33.66	84.74	2.08	37.42	75.51
Dissimilarity Index	12.69	47.20	10.06	16.25	45.06	15.12
Los Angeles						
Whites	32.11	80.07	95.62	53.93	81.64	91.05
Latinos	1.16	32.52	78.90	1.24	29.77	70.24
Dissimilarity Index	30.95	47.55	16.72	52.69	51.87	20.81
San Diego						
Whites	27.51	78.07	92.71	21.88	78.17	87.98
Latinos	1.68	36.61	72.93	2.51	37.66	74.56
Dissimilarity Index	25.83	41.46	19.78	19.37	40.51	13.42
Seattle						
Whites	20.12	76.30	83.06	10.93	72.28	79.59
Latinos	3.69	36.84	56.43	3.48	46.10	62.94
Dissimilarity Index	16.43	39.46	26.63	7.45	26.18	16.65

What I find is that segregation based on both the Separation Index and the Dissimilarity Index is highest between those in the middle "profile" on social and economic characteristics where both Whites and Latinos are U.S.-born and English-speaking, but they are set at low levels of education and income. The lowest levels of segregation alternate between when Whites and Latinos are set to the low assimilation profile and the high assimilation profile, but there is an important thing to note here which is that at the low level, very few Whites realistically fall within this category.

The overall story, therefore, is that in every city at both time points segregation is lower between Whites and Latinos who are matched on higher levels of assimilation than between Whites and Latinos who are recent immigrations without U.S. citizenship at low levels of socioeconomic status. The changes in socioeconomic status, nativity and citizenship have a larger impact on Latinos than they do for Whites due once again to the fact that Whites already experience high contact with other Whites but also because there are far less Whites in the lower assimilation categories. For Whites, nativity and citizenship are not as important for residential mobility in the way that socioeconomic status is. For Latinos, socioeconomic status had more of an impact but nativity and citizenship matter quite a bit as well.

Summary

To conclude this chapter, I will first reiterate that standardization and components analysis is an extremely useful and informative tool for working with micro-models of residential attainments that predict aggregate level segregation as demonstrated here. These exercises in manipulating the outcomes to assess the impact

of differences in group means, differences in rates of return, and individual factors such socioeconomic status and acculturation on segregation outcomes are helpful for gaining a greater understanding of the micro-level factors that contribute to segregation beyond simply running multivariate regression models. What can be concluded from the standardization and components analysis on the group means and rates of return is that while the differences in group means on the independent variables make a non-negligible contribute to the White-Latino differences in residential outcomes, the role of the disparities in rates of return is even larger.

In every case study that was analyzed in this chapter, equalizing Whites and Latinos on individual social characteristics went a long way towards closing the gap in residential outcomes, but even in that situation segregation persists due to the fact that Latinos are able to convert their social mobility into residential mobility at a lesser rate than Whites can. Thus while the results from the micro-models and from standardizing on the group means support the spatial assimilation framework, the fact that Whites get greater rates of return on their social characteristics than Latinos do speaks to something else. The place stratification perspective could be useful by explaining the disparity in rates of return as a discrimination effect, but the analyses implemented here are limited in their ability to confidently say that it is only discrimination and that no other factors are at work. This idea and these issues will be discussed further in the final conclusions.

The standardization analyses assessing the individual impacts that selected independent variables have on segregation outcomes revealed the complexity of the micro-level dynamics that drive observed patterns of segregation. While it is not

disputed that socioeconomic status is directly related to residential mobility, it is not so simple in how it operates at the group level. For Whites, socioeconomic status is a positive predictor of residential contact with other Whites, but the magnitude of the effect is much larger for Latinos and in fact it is gains in Latino socioeconomic status that drive the majority of the decline in segregation as both groups are moved from a low socioeconomic status to a high socioeconomic status. As explained before, this is an outcome that makes sense given that Whites are already close to the "ceiling" of maximum residential contact with other Whites and therefore do not have many more gains to be made, but Latinos are further away from that maximum outcome and so can make large gains in residential mobility that are integration-promoting.

These same techniques also gave insight into how assimilation dynamics affect segregation patterns. The general finding was that for Whites, the effects of nativity and citizenship are mostly negligible but for Latinos they can greatly contribute to residential outcomes. The effects of nativity and citizenship were not as large in magnitude as the effects of socioeconomic status, but the movement from Whites and Latinos being recent immigrants without U.S. citizenship to U.S-born resulted in a movement towards integration. It is important to clarify that these standardization analyses were only a controlled exercise in understanding the role of socioeconomic status and assimilation in segregation patterns and involved many chosen specifications that removed many of the complexities of the observed social world. The benefits of using these techniques are clear but there are limits to what empirical questions they can answer.

CHAPTER VI

ANALYZING CROSS-AREA VARIATION OF OBSERVED AND STANDARDIZED MEASURES OF SEGREGATION

Overview

In this final analysis chapter I analyze variation of segregation across 50 selected Metropolitan Statistical Areas based on 2010 data. The metropolitan areas are selected first on total population size and then on Latino population size so the final sample consists of large metropolitan areas (excluding cases having a large Black Latino population) and additional metropolitan areas that are smaller but have a large Latino population. The aggregate-level analyses are conducted using multivariate fractional logit regression. The dependent variables are the observed Separation Index and Dissimilarity Index as well as two standardized versions of these measures. The two standardized versions of the Separation Index and the Dissimilarity Index are: 1) the resulting measures when segregation-relevant residential attainments for Whites and Latinos have been standardized on White group means on social and economic characteristics and 2) the resulting measures when segregation-relevant residential attainments for Whites and Latinos have been standardized on the White rates of return estimated from the micro-models in Chapter 4.

The purpose of analyzing the standardized scores as well as the observed scores is to assess how cross-area variation in segregation changes when group differences in social and economic characteristics and group differences in the process of residential

attainment are controlled, and how effects of variables predicting cross-area variation in segregation change when the two groups are equalized at the micro-level, essentially removing micro-level variation that might be affecting aggregate-level patterns. Previous studies have hypothesized that group differences in social and economic characteristics may be an important determinant of cross-area variation in segregation and have attempted to control for these micro-based factors by including aggregate level measures such as percent foreign-born and the White-minority income ratio (Iceland and Nelson 2008; Iceland and Scopilliti 2008; Licther et al. 2010). However as discussed in Chapter 3, the use of aggregate-level controls to account for these factors is not statistically appropriate. The analyses performed here control for these factors in a statistically appropriate way by standardizing the White-Latino segregation comparison on social and economic characteristics using the MSA-specific group attainment equations.

The MSA-level factors that are included as predictors in the aggregate-level regressions are the natural log of the total population, whether or not the MSA is a "new Latino destination," the percent of the population that is non-White, the percent of the total labor force in the armed forces, and the percentages of the total labor force in three industries – agriculture, manufacturing, and retail trade. These are commonly used independent variables in past literature for aggregate-level analyses of segregation (Iceland and Scopilliti 2008; Lichter et al. 2010) and have been found to be relevant contextual factors that predict levels of segregation in an area.

I will begin this chapter by first reviewing the measures of segregation for all 50 MSAs, including the measures when standardized on White group means and rates of return at the individual level. Following this discussion, I will discuss the correlations among the observed and standardized segregation scores to determine how much of a difference standardization makes depending on the choice to standardize on group means or rates of return. Finally, I will present the fractional logit regression results estimated using the 50 MSA sample separately for each of the six outcomes mentioned above. I will conclude this chapter with a discussion of the contextual factors that predict cross-area variation and how these change when micro-level factors are controlled for using standardization techniques.

Observed and Standardized Segregation Scores for 50 Metropolitan Areas

In Table 32 I present the observed Separation Index scores for the 50 MSAs in the analysis as well as the Separation Index when Whites and Latinos are standardized on White means on social and economic characteristics and when Whites and Latinos are standardized on White rates of return estimated from the micro-models.

Table 32. Observed and Standardized Separation Index for 50 MSAs

Metropolitan Area	Observed Separation Index	Standardized Separation Index (Means)	Standardized Separation Index (Rates)
Albuquerque, NM	24.85	17.56	4.59
Atlanta, GA	29.61	11.81	6.75
Austin, TX	28.80	15.64	6.47
Bakersfield, CA	43.19	27.17	17.08
Birmingham, AL	25.66	9.10	1.86
Brownsville, TX	37.74	32.46	22.83
Charlotte, NC	28.74	10.40	6.87
Chicago, IL	39.85	26.31	5.22
Cincinnati, OH	9.34	4.52	0.69
Columbus, OH	11.38	6.24	2.12
Corpus Christi, TX	34.37	27.56	9.39
Dallas-Fort Worth, TX	37.31	19.13	11.19
Denver, CO	26.36	14.75	5.12
Detroit, MI	18.56	11.14	0.66
El Paso, TX	23.24	16.51	7.13
Fresno, CA	36.87	22.94	8.69
Houston, TX	42.28	24.53	11.71
Indianapolis, IN	20.24	9.57	4.39
Kansas City, KS	20.69	10.81	2.67
Laredo, TX	6.30	4.41	2.30
Las Vegas, NV	24.73	9.46	6.20
Los Angeles, CA	50.39	31.41	5.30
Louisville, KY	12.30	4.65	3.78
McAllen, TX	36.89	32.47	22.20
Memphis, TN	24.99	9.36	5.58
Milwaukee, WI	33.46	17.96	3.26
Minneapolis, MN	13.67	6.09	1.80

Table 32 (continued)

Metropolitan Area	Observed Separation Index	Standardized Separation Index (Means)	Standardized Separation Index (Rates)
Modesto, CA	23.24	14.26	5.57
Nashville, TN	17.43	6.92	6.74
New Orleans, LA	18.07	9.63	3.94
Oklahoma City, OK	23.73	11.14	3.44
Omaha, NE	22.59	10.55	3.71
Oxnard, CA	40.89	23.94	8.42
Phoenix, AZ	34.40	20.69	6.67
Portland, OR	12.80	4.76	2.50
Raleigh, NC	24.37	9.40	5.86
Riverside, CA	31.23	19.70	9.97
Sacramento, CA	19.43	12.01	4.08
St. Louis, MO	7.60	4.57	0.64
Salinas, CA	51.49	30.43	14.59
Salt Lake City, UT	17.43	9.46	4.33
San Antonio, TX	34.65	26.56	7.67
San Diego, CA	34.21	20.06	5.26
San Francisco, CA	30.09	14.37	6.20
San Jose, CA	34.33	20.96	8.23
Seattle, WA	11.28	5.08	2.92
Stockton, CA	24.87	15.31	6.82
Tucson, AZ	34.14	24.32	4.93
Tulsa, OK	17.98	7.86	5.81
Visalia, CA	33.02	21.09	12.89

In this sample there is clearly a wide variety of levels of segregation based on the Separation Index, but, in general, the change from the observed Separation Index to the standardized versions of the Separation Index are consistent regardless of the level of overall segregation in the MSA. In every city, standardizing on the means for social and

economic characteristics lowers the predicted segregation outcome by a noticeable amount and standardizing on the rates of return to social and economic characteristics generates even lower predictions. If White-Latino differences in rates of return are interpreted as reflecting discrimination, the results suggest that eliminating the role of discrimination in residential outcomes for Latinos produces the lowest predictions for White-Latino segregation. Similarly, but to a lesser degree, if the White-Latino differences in means on social and economic characteristics are interpreted as reflecting the role of Latino deficits in acculturation and socioeconomic assimilation, the results suggest that removing the role of compositional differences through acculturation and socioeconomic assimilation would lead to lower predicted levels of segregation as well.

In Table 33 an identical descriptive list of observed and standardized scores are presented for the 50 metropolitan areas in the sample, but this time for the Dissimilarity Index. Overall patterns are similar to the results for the Separation Index in that the scores standardized on group means for social and economic characteristics are lower than the observed scores and the scores standardized on the rates of return to these characteristics are the lowest at all. However, when comparing the Dissimilarity Index scores to the Separation Index scores, the difference in how the measures are calculated and what they signal is apparent.

Table 33. Observed and Standardized Dissimilarity Index for 50 MSAs

Metropolitan Area	Observed Dissimilarity Index	Standardized Dissimilarity Index (Means)	Standardized Dissimilarity Index (Rates)
Albuquerque, NM	43.83	29.40	7.71
Atlanta, GA	59.13	27.62	20.77
Austin, TX	52.10	28.10	11.98
Bakersfield, CA	61.18	38.33	19.04
Birmingham, AL	59.52	24.96	11.69
Brownsville, TX	61.36	48.16	28.61
Charlotte, NC	62.29	34.09	23.00
Chicago, IL	63.27	42.39	11.87
Cincinnati, OH	53.46	34.77	13.74
Columbus, OH	52.02	33.36	17.17
Corpus Christi, TX	51.88	41.17	12.75
Dallas-Fort Worth, TX	60.50	30.62	19.12
Denver, CO	54.04	30.03	13.39
Detroit, MI	50.17	35.61	4.29
El Paso, TX	50.73	33.81	16.57
Fresno, CA	55.03	34.32	10.69
Houston, TX	62.79	34.79	18.07
Indianapolis, IN	60.18	33.29	15.94
Kansas City, KS	55.72	33.97	13.15
Laredo, TX	40.84	27.06	13.70
Las Vegas, NV	47.27	17.15	12.08
Los Angeles, CA	68.56	42.41	5.80
Louisville, KY	54.48	26.51	19.13
McAllen, TX	63.17	50.25	28.10
Memphis, TN	58.23	30.19	31.84
Milwaukee, WI	64.25	37.82	11.40
Minneapolis, MN	55.43	33.91	11.27

Table 33 (continued)

Metropolitan Area	Observed Dissimilarity Index	Standardized Dissimilarity Index (Means)	Standardized Dissimilarity Index (Rates)
Modesto, CA	43.86	25.42	6.92
Nashville, TN	58.01	34.48	27.74
New Orleans, LA	44.43	28.40	13.26
Oklahoma City, OK	57.24	31.49	10.40
Omaha, NE	59.36	35.68	12.48
Oxnard, CA	60.77	37.56	14.46
Phoenix, AZ	58.06	33.91	13.00
Portland, OR	47.32	19.77	13.77
Raleigh, NC	54.20	28.58	16.71
Riverside, CA	49.82	31.23	15.55
Sacramento, CA	44.23	28.54	10.53
St. Louis, MO	44.57	36.28	6.72
Salinas, CA	69.08	41.85	14.45
Salt Lake City, UT	48.96	25.06	15.48
San Antonio, TX	53.47	40.58	12.18
San Diego, CA	56.11	32.71	9.76
San Francisco, CA	55.31	27.81	13.02
San Jose, CA	56.03	34.80	14.64
Seattle, WA	42.31	23.15	14.74
Stockton, CA	43.46	25.90	13.37
Tucson, AZ	52.50	37.30	9.36
Tulsa, OK	56.72	25.45	14.98
Visalia, CA	50.10	30.36	16.32

While the Separation Index is a straightforward calculation of the group difference in neighborhood proportion White, the Dissimilarity Index relies on the city-level proportion White for its measurement and so from city to city, this standard changes. This results in high proportion White for the city population such as Portland

receiving a very low Separation Index score (12.80) and a relatively high Dissimilarity Index score (47.32). In high proportion White cities, the proportion of Latinos who live in neighborhoods that equal or exceed proportion White for the city as a whole is low which produces a high score on the Dissimilarity Index but the Latinos in these cities are still living in predominately White neighborhoods.

This is an outcome that Fossett (forthcoming) terms "segregation without group separation and neighborhood polarization" and that Fossett, Fox, Saenz, and Zhang (2014) report is a common pattern for Latinos, especially in New Destination communities. This residential outcome occurs when a substantial fraction of the minority population lives in neighborhoods that fall short of parity on area proportion White, but by amounts that are quantitatively small. Thus, group displacement from even distribution is extensive, but the magnitude of the reference point for even distribution is modest. This pattern can be contrasted with "prototypical" segregation, which many may incorrectly believe is present when the Dissimilarity Index takes a high value. Prototypical segregation involves minority concentration in ghettos or barrios such as in Chicago for Blacks or Los Angeles for Latinos (Fossett, Fox, and Zhang 2014). In these situations, minority displacement from even distribution is extensive ***and*** the minority population is residentially separated from the White population in this case with Whites living in predominantly White neighborhoods and Latinos living in predominantly Latino neighborhoods.

Relationship between Observed and Standardized Segregation Scores

In Table 34 I present the correlations between the observed and standardized scores on the Separation Index and the Dissimilarity Index. The purpose of calculating these correlations is to demonstrate the difference that results from choosing to standardize on group means on social and economic characteristics or on group rates of return to these characteristics. The scores for the Separation Index standardized on group means are highly correlated with the observed scores at 0.91 while the scores standardized on the rates of return are only moderately correlated, indicating that there is a greater variation across cities in the impact of standardizing on rates of return. For the Dissimilarity Index, the scores that have been standardized on the rates of return are again the least correlated with the observed scores, but the scores standardized on group means are less correlated with the observed scores in comparison to what was found with the Separation Index. This is again a reflection of the nature of the Dissimilarity Index and how it signals changes based on a city-specific threshold.

Table 34. Correlation Matrix for Observed and Standardized Scores

	Separation Index		Dissimilarity Index	
	Observed	Standardized (Means)	Observed	Standardized (Means)
Standardized (Means)	0.9136	---	0.6012	---
Standardized (Rates)	0.6619	0.7494	0.3365	0.1829

Descriptive Findings for Contextual-Level Independent Variables

In Table 35 I present the summary statistics for the segregation measures and contextual-level variables on the 50 MSAs in the analysis sample. As was described in the previous section, the observed segregation measures are on average the highest whereas standardizing the scores on the group means lowers the outcome some and standardizing the scores on the group rates lowers them even further. Another thing to observe is that the Separation Index is always lower than the Dissimilarity Index. The average population size is quite large due to the sample selection criteria implemented, in selecting the MSAs for the analysis many were chosen for being the largest in total population. About a third of the MSAs are classified as being "new destinations," meaning that they are areas where the Latino population has only recently emerged in the last two decades as a result of a new wave of migration out of the traditional Southwest and into Midwestern and Southern areas. On average, Whites comprise just over half of the population. The average percent non-White in this sample is likely to be skewed by the inclusion of predominately Latino MSAs such as Brownsville, McAllen, El Paso and Laredo.

Table 35. Descriptive Statistics for Contextual-Level Analysis Variables

Variable	Mean	Standard Deviation
Segregation Measures		
Observed Separation Index	26.82	10.81
Standardized Separation Index (Means)	15.47	8.28
Standardized Separation Index (Rates)	6.60	4.78
Observed Dissimilarity Index	54.53	6.92
Standardized Dissimilarity Index (Means)	32.46	6.52
Standardized Dissimilarity Index (Rates)	14.76	5.65
Demographics		
Population Size	2323324	2360969
New Destination	36%	48.49
Percent Non-White	46.39%	19.99
Labor Force		
Percent in Armed Forces	0.63%	1.01
Percent in Agriculture	2.50%	3.93
Percent in Manufacturing	9.60%	3.46
Percent in Retail	11.54%	0.84

Cross-Area Regression Analyses on Observed and Standardized Separation Index

In this section I present and discuss the results of fractional logit regressions that predict variation in the Separation Index across the selected 50 MSAs using the contextual-level independent variables described previously. The estimated effect coefficients for the independent variables for the observed Separation Index, the Separation Index standardized on group means, and the Separation Index standardized on rates of return are presented in Table 36 as well as their standard errors. Following this discussion I will then review the same models for the Dissimilarity Index.

The first finding is that for all variations on the Separation Index, population size is a positive and significant predictor of segregation, though the magnitude of the coefficient is reduced when the segregation scores are standardized. A possible explanation for why population size is less relevant when micro-level group differences are controlled for is because larger cities tend to be more diverse and the Latino population is more likely to have a larger foreign-born presence in addition to a wider range of socioeconomic outcomes which would bring down the average residential contact that Latinos have with Whites. When these differences are controlled for by equalizing Latinos alternatively on the White group means and the White rates of return, the compositional differences associated with larger cities matter less making the level of segregation for larger cities less distinct from that for smaller ones.

Table 36. Fractional Logit Regressions for Observed and Standardized Separation Index

	Observed		Standardized (Means)		Standardized (Rates)	
Variables	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Demographics						
(Ln) Total Population	0.3295**	0.0920	0.2453*	0.1092	0.2399*	0.1080
New Destination	0.0207	0.1712	-0.3623*	0.1811	0.1217	0.1630
Percent Non-White	0.0165**	0.0053	0.0166**	0.0057	0.0250**	0.0058
Labor Force						
Percent in Armed Forces	0.0396	0.0548	0.0362	0.0554	-0.0493	0.0597
Percent in Agriculture	0.0515**	0.0181	0.0448*	0.0188	0.0640**	0.0227
Percent in Manufacturing	-0.0023	0.0170	0.0116	0.0194	-0.0095	0.0212
Percent in Retail	-0.1255*	0.0616	-0.0004	0.0681	0.0549	0.0822
Constant	-5.2032**	1.7066	-6.1630**	2.0760	-8.0891**	2.2473

Note: * = $p < 0.05$; ** = $p < 0.01$.

The second finding is that percent non-White is also a positive and significant predictor of segregation, with its direction and significant maintained regardless of whether the scores are standardized or not. This finding is supported by the ecological theory of competitive ethnic relations (Blalock 1967; Fossett and Kiecolt 1989; Fossett and Cready 1998) which argues that in cities where the non-White population is more predominant, Whites will be more likely to residentially separate themselves to preserve their residential advantages in response to a real or perceived competitive threat to their favored position.

The new Latino destination distinction is only relevant when the scores are standardized on the means, predicting that segregation is lower in new destinations where Latino settlement is recent as compared to cities where Latinos have historically resided. The less consistent finding is the effect of the variables measuring MSA industrial composition, though the percent in agriculture is always a positive and significant predictor of segregation. The variation in the effects of percent manufacturing and retail are less consistent in their effects and in these regressions the percent in armed forces is never relevant for segregation outcomes. However, military participation is controlled for at the micro-level and was found to be an important factor in individual level residential outcomes. It is also important to note that with the sample size of 50 cases is relatively small and, because of the selection on MSA size is less heterogeneous in terms of community characteristics such as industrial structure and military presence, it may be more difficult to detect effects of variables that have moderate to small effects on segregation.

Overall the findings based on the observed scores are consistent with previous literature, particularly in the case of the effects of population size and percent non-White. The advantage to studying the outcomes when the scores are standardized to control for group differences in means and rates of return is that it can be said that most of the contextual level effects stay consistent with the exception of population size which becomes weaker after the scores have been standardized. This result will be discussed further at the conclusion of this chapter. The next step is to review the results for the Dissimilarity Index and assess whether the results found for the Separation Index are replicated when using a second measure of evenness.

Cross-Area Regression Analyses on Observed and Standardized Dissimilarity Index

The fractional logit regression results for the Dissimilarity Index are presented in Table 37. The results reveal once again the unique nature of the Dissimilarity Index that causes it to respond more dramatically to changes in the individual scores that used to calculate the index.

Table 37. Fractional Logit Regressions for Observed and Standardized Dissimilarity Index

	Observed		Standardized (Means)		Standardized (Rates)	
Variables	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Demographics						
(Ln) Total Population	0.2107**	0.0585	0.0818	0.0715	0.1090	0.0837
New Destination	0.3934**	0.0879	0.0153	0.1107	0.7217**	0.1584
Percent Non-White	0.0080**	0.0027	0.0052	0.0033	0.0168**	0.0044
Labor Force						
Percent in Armed Forces	0.0261	0.0319	0.0297	0.0328	-0.0582	0.0332
Percent in Agriculture	0.0289*	0.0135	0.0185	0.0124	0.0071	0.0138
Percent in Manufacturing	0.0033	0.0092	0.0177	0.0154	-0.0179	0.0156
Percent in Retail	-0.0417	0.0522	0.0689	0.0634	-0.0023	0.0693
Constant	-2.9807*	1.2854	-3.1770*	1.4390	-4.1679**	1.5201

Note: * = $p < 0.05$; ** = $p < 0.01$.

For the observed Dissimilarity Index, population size and percent minority are once again positive predictors of segregation similar to the results for the observed Separation Index. In this model, the new destination distinction is also positive and significant consistent with past research (Lichter et al. 2010). There is a substantive explanation for why new destinations have higher scores on the Dissimilarity Index than areas with an established Latino population; it is that new destination MSAs have a higher proportion White, causing the threshold for receiving a score of "1" in the calculation of the index to be higher. Thus, similar to other high proportion White areas like the previous example of Portland, Latinos may be living in neighborhoods with a high proportion White, but the proportion is not as high as the city proportion White and so the Dissimilarity Index is high.

When the standardized scores are modeled, the results change dramatically. For the Dissimilarity Index standardized on group means, none of the predictors in the model have a significant effect on segregation. When the index is standardized on group means, only the new destination distinction and percent minority are significant, and their direction is again positive. One way to interpret these findings is that the cross-area variation in the Dissimilarity Index is strongly affected by compositional factors so that when Whites and Latinos are equalized on composition, the contextual level factors no longer explain any variation between MSAs. In contrast, when the Dissimilarity Index is standardized on rates of return, percent minority and the new destination distinction still matter, though population size is no longer significant.

Summary

In conclusion of this chapter, the value of using standardization techniques is further extended by analyzing standardized measures as well as observed measures of segregation when conducting cross-area analyses of segregation. The purpose of the previous two analysis chapters has been to emphasize the micro-level factors that drive segregation and demonstrate methods for analyzing those factors within single cities. However, often there is a desire to look beyond the context of a single city and instead conduct a more inclusive and wide-ranging analysis of multiple cities in order to explain why segregation levels vary from one area to the next.

Before this study, the ability to conduct that kind of analysis while also accounting for the micro-level factors that are analyzed using individual-level models of residential attainment was nonexistent. However, because of the direct quantitative link that has now been established between micro-level processes of residential attainments and overall segregation patterns by re-conceptualizing segregation measures as a difference in group means, those micro-level factors that are known to be relevant for segregation outcomes can be controlled for by conducting micro-models and generating segregation scores that have been standardized to eliminate group differences in social and economic characteristics and the rates of return on those characteristics.

What has been found in the results presented in this chapter is that as compared to modeling the observed scores, modeling the standardized scores somewhat changes the effects that some contextual factors have on levels of segregation. One of the most consistent findings is that when modeling the standardized scores, the effect of

population size on segregation weakens. When the observed scores are modeled, larger cities are found to be more segregated than smaller ones. However, after compositional and discrimination factors at the micro-level are controlled, the effect of population size is not as strong though still important, which could be interpreted as there being more compositional variation and discrimination in larger cities where the Latino population is larger and more diverse both socially and economically, a distinction that is eliminated after standardization. Other findings are less consistent, though the percent non-White in the population is nearly always a positive and significant predictor of segregation even when the scores are standardized on group means and rates of return. Whites will be more residentially separated as the proportion of the non-White population increases, which is a supported finding in the literature. The main conclusion however, is that micro-level compositional differences play a secondary role in explaining cross-area variation in levels of segregation which can moderate contextual-level factors such as population size.

There is a limitation to reiterate here regarding the contextual-level models presented in this chapter. The first is that the sample size is quite small with only 50 MSAs included in the analysis, and so finding statistical significance is difficult to do[9]. This is a limitation of choosing to look at the largest metropolitan areas only because there are few that qualify, but this is unavoidable due to the fact that these analyses relied on restricted data and using smaller cities is often not feasible because of issues

[9] Tolerance tests were conducted for the independent variables and all were found to have unique variance and no concerning levels of multicollinearity. In addition, the models were run using robust regression and the effects remained consistent. Thus, the primary issue is the size of the sample.

with maintaining confidentiality. However, there is a long-standing precedent for only looking at the top 50 or 60 MSAs based on total and Latino population size in the literature (Duncan and Duncan 1955; Massey and Denton 1988) and so this sample size is no better or worse than those used in past research. A future goal would be to extend this analysis to include more areas so that the effects of any relevant factors can be made clearer. More on future endeavors along this line of research will be discussed in the following chapter where I will make my final conclusions.

CHAPTER VII

CONCLUSIONS

Overview

In this dissertation my goals have been to use new methods and techniques to gain a more detailed and comprehensive understanding of the micro-level dynamics that drive patterns of White-Latino segregation. In Chapter 3 I described these new measures and techniques and their potential in future research on segregation outcomes. By re-conceptualizing widely used measures of segregation such as the Dissimilarity Index and the Separation Index in a "difference of means" format as described by Fossett (2009; forthcoming), aggregate-level segregation patterns can be explained by conducting micro-models at the individual level where social processes of residential attainments are occurring. The predicted group means produced using these models are the quantitative components that determine the value of the segregation index in question, and so any study of segregation can begin at the micro-level due to the direct quantitative link between the individual scoring and the overall measure of segregation for the area.

I accomplished this goal by studying six cities in depth chosen to represent different kinds of areas where the Latino population is present: established areas of Latino settlement where the Latino population is large and segregated (Chicago, Houston, Los Angeles, San Diego), areas where the Latino population is fairly new but growing rapidly (Atlanta), and areas where the Latino presence is new and small and the city is still predominately White (Seattle). This selection of cities revealed how micro-

level factors that affect residential attainments operate within different contexts. For instance, social and economic characteristics are less important in Seattle where residential contact with Whites is high for everybody – Latinos as well as Whites – and more important in Los Angeles where segregation is prevalent and Latino residential contact with Whites is relatively low. In addition, studying these outcomes at two different points in time provided some insight into how the impact of these factors is changing as demographic composition and levels of segregation continue to shift.

Conclusions about how micro-level factors drive segregation was further refined by conducting standardization and components analysis to assess the contribution that differences in composition and in rates of return make on overall differences in residential outcomes. These techniques are again only possible due to the reconceptualization of segregation measures to understand them as the difference in group specific average residential outcomes that are calculated from individual scores, which allow for the ability to conduct micro-models. Standardization and components analysis is not a new concept, but this is the first time that these methods have been applied to a study of White-Latino segregation patterns.

Finally, I was able to conduct the type of cross-area analyses of segregation that are prevalent in the literature using contextual-level explanatory variables while appropriately controlling for individual-level factors at the level where they occur. This was accomplished using the standardization techniques introduced in Chapter 5 which eliminated the impact of group differences in social and economic characteristics and group differences in rates of return so that those differences would no longer be affecting

aggregate-level outcomes, thus allowing for refined regression analyses assessing the effects of contextual-level factors on segregation. Below I review in detail both my substantive and methodological conclusions from this study, followed by an acknowledgement of the limitations of this study and future research goals. The purpose of this chapter will be to not only summarize this study but also encourage future research to implement the methods used here because of their ability to allow one to quantitatively assess the theoretical frameworks grounded in micro-level dynamics that are used to explain aggregate level segregation patterns.

Substantive Conclusions

This study was primarily guided by the spatial assimilation framework and supplemented by the place stratification perspective, the two most widely acknowledged theoretical foundations for understanding racial residential segregation. In conducting micro-models of residential attainments that directly predict levels of segregation, I was able to assess the role that individual social and economic characteristics, which spatial assimilation would hypothesize to be positive predictors of residential social mobility and spatial assimilation, play in determining overall patterns of segregation. Beyond that, using standardization and components analysis I was also able to decompose the segregation for an area into the contributions that White-Latino differences in social and economic characteristics and White-Latino differences in the rates of return on those characteristics make to the overall measure of segregation.

My findings are supportive of both the spatial assimilation and place stratification perspectives, which have been thought to be complementary processes of

residential outcomes in the past. Compositional differences based on individual social and economic characteristics are partially responsible for White-Latino segregation, and Latino gains in socioeconomic status and acculturation are positive predictors of residential contact with Whites which would result in greater residential integration. However, the standardization and components analysis revealed that the difference in rates of return between Whites and Latinos on those individual characteristics also are a large component in White-Latino differences in residential outcomes. In other words, even when Latinos are matched with Whites on all social and economic characteristics relevant for residential mobility, the rates of return that Latinos get on those characteristics are much lower than those for Whites and thus Latinos do not receive returns equal to Whites. This can be interpreted as a discrimination element preventing Latinos from experiencing the same levels of residential mobility that Whites do. Therefore, the place stratification framework, which would argue that race-based discrimination prevents full residential integration, is also supported by my findings.

In addition to these general patterns that support theories of both spatial assimilation and discrimination, more detailed analyses using standardization techniques revealed that for Latinos, education, income, citizenship and nativity have varying and large effects with education appearing to have the greatest impact on residential mobility. Compared to Latinos with a high school education, Latinos with a post-graduate degree are notably more integrated. In addition, through standardization I found that at lower levels of socioeconomic status, Whites and Latinos are more

segregated than at higher levels. Therefore when both groups are at the lower end of the socioeconomic spectrum, they are likely to be more segregated from each other.

Beyond these micro-level findings, I also found that cross-area variation in segregation outcomes is moderated by micro-level factors. In analyzing both the observed segregation scores and scores that have been standardized to eliminate group means on social and economic characteristics and on rates of return, the effect of demographic variables such as population size were weakened though still important. As discussed in Chapter 6, this would suggest that larger cities experience more segregation because of greater compositional differences between Whites and Latinos as compared to smaller areas. When these compositional differences are appropriately controlled for at the micro-level, population size explains less of the variation in segregation across metropolitan areas.

Thus the substantive conclusions to be made from this study are that White-Latino segregation is largely driven by micro-level factors including White-Latino differences in social and economic characteristic but also, and perhaps more importantly, by the differences between Whites and Latinos on the rates of return on residential mobility that they receive for social and economic gains. Whites stand to benefit more from social and economic gains than Latinos, and this inequality causes segregation to persist. The question of whether this is the result of discrimination or something more related to neighborhood preferences for in-group contact is left open for interpretation, but the more widely supported explanation is discrimination. Aggregate level analyses could not address these questions and so only through the use of micro-models can these

ideas be explored further. In the next section, I discuss the methodological contributions and conclusions derived from this study.

Methodological Conclusions

There are multiple methodological contributions made in this study, beginning with the demonstration of how new formulations of popularly used segregation indices developed by Fossett (2009; forthcoming) open the door for analyzing the factors that influence segregation patterns at the micro-level where they occur. By calculating segregation indices based off of individual scores for residential attainments, the index itself is mathematically the same but can be thought of as an aggregation of individual level outcomes that can be analyzed in a multivariate modeling framework. Whereas previously studies of residential attainments could not be linked to aggregate segregation patterns and studies of aggregate-level segregation could not be quantitatively explained by micro-level factors due to the way in which the indices were formulated, now the link between residential attainments and segregation is possible to establish. Significantly, re-conceptualizing segregation indices such as the Dissimilarity Index as a difference of group means does not mathematically change the index itself, so nothing is lost by using these new formulations, but much is gained as they make more detailed analyses of segregation outcomes at multiple levels possible.

The second methodological contribution of this study is the implementation of standardization and components analysis after conducting group-specific micro-models of White and Latino residential attainments. To reiterate, standardization and components analysis are not new methods, but they are new in the context of studying

segregation while taking account of the role of multiple social and economic characteristics because the methodology to use these techniques in segregation research previously was not developed. However, with the coefficients from the micro-models estimated which directly predict segregation outcomes and with knowledge of the group means on relevant social and economic characteristics, standardization and components analysis is possible and the contributions that compositional differences and discrimination make to overall segregation patterns can be quantitatively assessed. By using these methods I was able to conclude that compositional differences that are accounted for in modeling residential attainments matter for segregation outcomes, but differences in rates of return have an even larger impact. The usefulness of these techniques goes further as it is also possible to generate predicted segregation outcomes when Whites and Latinos are given specific characteristics, which allows for single-variable manipulation in order to understand the impact of individual independent variables in the model.

The final major contribution is that using standardization techniques I was able to generate predicted values on segregation scores when Whites and Latinos have been equalized on social and economic characteristics and on rates of return. The benefit of this is that in conducting an MSA-level cross-area analysis to assess the effects of contextual factors that explain cross-area variation in segregation, using the standardized scores as the dependent variables essentially controls for micro-level factors that might be influencing the estimated effect coefficients for the contextual-level factors. This was found to be the case for the effect of population size, as the effect was moderated when

modeling the standardized scores as opposed to the observed scores. This is a useful technique because it is a statistically appropriate way to conduct a contextual-level analysis while controlling for micro-level factors. Modeling the standardized as well as the observed scores can give insight into how micro-level factors play a role in cross-area variation as well.

There are more minor methodological points to make which were not the focus of this study but are worth mentioning. The first is that the decision on which measure of evenness to use is an important one as the results can vary based on how the measure is calculated. The Separation Index is a straightforward calculation of the group difference in neighborhood proportion White which lends itself to an easier interpretation and also is not affected by the city's overall ethnic composition. However the Dissimilarity Index, which was also used in this study, is calculated with a binary scoring system where individuals receive a score of "1" if they live in a neighborhood where the proportion White is greater than the city-level proportion White and they are given a "0" otherwise. This calculation can be more problematic because it is dependent on the city-level ethnic composition which changes depending on the area. Using the Dissimilarity Index requires more caution in drawing interpretations because the demographics of the city must be taken into consideration. The methodological recommendation that I make here is to use the Separation Index as it involves a relatively simple calculation and will always accurately signal when there is real residential separation between the two groups in the analysis. However, the Dissimilarity Index is not without its uses and is the more popular index, so there is

nothing to be lost by using multiple measures of the same outcome so long as it is understood what each measure is addressing.

One last methodological point to make is that these analyses could not have been conducted without access to restricted-use census microdata, where the individual records from the decennial census and the population surveys are available along with neighborhood-level geographic information. These two things are not available in any public format simultaneously due to issues with respondent confidentiality and so the only option is to access the restricted-use data. To advance this literature on residential segregation and attainments, the move to restricted-use data must happen. Some have already acknowledged this and have moved into the restricted-use environment (Iceland and Scopilliti 2008), and more will follow. This will absolutely have to be the case in order to implement the methods demonstrated in this study. Thus this last methodological point that I make is that in conducting residential segregation research, researchers must consider accessing the restricted-use census microdata as it is the best available data source for segregation analysis.

Limitations

Although this study accomplished a much more detailed analysis of White-Latino segregation at multiple time points, there were limitations that hindered the ability to draw conclusions regarding some aspects that warrant mentioning. The first is that although this study focused on two time points, 2000 and 2010, a time analysis was not conducted and so statements about changes in segregation patterns and the factors that influence those patterns were limited to descriptive interpretations only. In order to

say definitely that there were changes over time, the effect of time would need to be brought into the models as an interaction term. Doing this is well within the scope of possibility and may be revisited in later research. However, future studies will need to investigate what impact, if any, on segregation measurement is introduced with the transition from estimating segregation using large samples from the decennial census in contrast to using a smaller sample obtained by combining multiple years of the American Community Survey.

The second limitation is that due to the confidentiality issues regarding the restricted-use data, the estimated coefficients from the residential attainments micro-models for MSAs smaller than the six case studies presented are difficult to release because of the smaller sample sizes involved, especially when using the American Community Survey samples. This limits the kind of analyses presented in Chapters 4 and 5 to larger metropolitan areas where it is not possible to individually identify respondents in the data. Solutions to this issue could involve only releasing predicted values for smaller cities rather than the model coefficients at the cost of transparency or simply suppressing effect coefficients where sample size is a problem.

Finally, in this study Latinos were treated as a large panethnic group even though the Latino population is actually comprised of multiple ethnic groups with a wide range of racial identities. In the case of Black Latinos, it can be problematic to not account for Latino subgroups because outcomes for Black Latinos tend to be markedly different from other Latino groups in the U.S. This was somewhat controlled for by excluding MSAs where the Black Latino population was present but the cost is that most of the

major Northeastern cities were excluded as a result. It would be more appropriate to account for Latino subgroups by including them as dummy variables in the models, however for the sake of this study that would be problematic as those same dummy variables would not make sense in the micro-models for Whites. Nonetheless, accounting for Latino subgroup variation must be considered in the future rather than treating Latinos as a single homogenous group.

Future Research

The limitations mentioned in the previous section can all be addressed in future research, particularly the assessment of time variation in segregation outcomes. The Latino population is dynamic and young and driving most of the changes in U.S. demographics, so an assessment of how residential patterns change over time would be extremely informative and help answer questions about how the social landscape is transforming as the Latino population grows in demographic importance. Thus in the future it would be helpful to not only analyze the effect of time from 2000 to 2010, the relevant time points in this study, but to expand the timeline to include past years of census data such as 1990 and future years yet to come with the next census being conducted in 2020.

I will expand on this study further by including an analysis of Latino subgroups, another limitation that was described in the previous section. It is important to address variation within the Latino population because treating them as a singular group masks the effects that Latino subgroup identity might be having. In addition, the analyses conducted in this study can be extended to look at other segregation outcomes such as

White-Black segregation and White-Asian segregation. It is known that Black segregation is not as well explained by spatial assimilation theory due to the extensive history of discrimination that the Black population faces in the U.S. and so the question of how social and economic characteristics relate to residential mobility for Blacks can be answered with the same methods used in this study. In contrast, Asians tend to be the least segregated from Whites of all of the major racial and ethnic groups and their outcomes may be best explained by spatial assimilation theory, so applying these methods to analyses of White-Asian segregation could give better insight into how Asian residential outcomes compare to those of other groups similar to applying these methods to Black residential outcomes.

Final Thoughts

The methodological techniques implemented in this study will prove to be useful for all future residential segregation research. Many of the questions that were explored here were only possible because of the innovations of these methods. My hope for the future is that these new methods will expand our understanding of racial residential segregation patterns and strengthen the theoretical foundations that guide those understandings. The direct quantitative link between racial residential segregation and the micro-level social processes that drive it has been established here and now the possibilities are seemingly endless for this area of research.

REFERENCES

Alba, Richard D. and John R. Logan. 1991. "Variations on Two Themes: Racial and Ethnic Patterns in the Attainment of Suburban Residence." *Demography* 28:431-53.

Alba, Richard D. and John R. Logan. 1992. "Analyzing Locational Attainments: Constructing Individual-Level Regression Models Using Aggregate Data." *Sociological Methods & Research* 20:367-97.

Alba, Richard D. and John R. Logan. 1993. "Minority Proximity to Whites in Suburbs: An Individual-Level Analysis of Segregation." *American Journal of Sociology* 98:1388-1427.

Alba, Richard and Victor Nee. 2003. *Remaking the American Mainstream: Assimilation and Contemporary Immigration*. Harvard University Press: Cambridge MA.

Althauser, Robert P. and Michael Wigler. 1972. "Standardization and Component Analysis." *Sociological Methods and Research* 1:97-135.

Blalock, Hubert M., Jr. 1967. *Toward a Theory of Minority-Group Relations*. Capricorn Books: New York.

Blau, Peter. 1977. *Inequality and Heterogeneity: A Primitive Theory of Social Structure*. Free Press: New York.

Bobo, Lawrence and Camille Zubrinsky. 1996. "Attitudes on Residential Integration: Perceived Status Differences, Mere In-Group Preference, or Racial Prejudice?" *Social Forces* 74:883-909.

Breton, Raymond. 1964. "Institutional Completeness of Ethnic Communities and the Personal Relations of Immigrants." *American Journal of Sociology* 70:193-205.

Charles, Camille Zubrinsky. 2003. "The Dynamics of Racial Residential Segregation." *Annual Review of Sociology* 29:167-207.

Clark, William A.V. 1992. "Residential Preferences and Residential Choices in a Multiethnic Context." *Demography* 451-66.

Clark, William A.V. 2002. "Ethnic Preferences and Ethnic Perceptions in Multi-Ethnic Settings." *Urban Geography* 23:237-56.

Denton, Nancy and Douglas Massey. 1989. "Racial Identity among Caribbean Hispanics: The Effect of Double Minority Status on Residential Segregation." *American Sociological Review* 54:790-808.

Duncan, Otis Dudley and Beverly Duncan. 1955. "A Methodological Analysis of Segregation Indexes." *American Sociological Review* 20:210-7.

Duncan, Otis Dudley and Stanley Lieberson. 1959. "Ethnic Segregation and Assimilation." *American Journal of Sociology* 64:364-74.

Ellen, Ingrid Gould. 2000. *Sharing America's Neighborhoods: The Prospects for Stable Racial Integration.* Harvard University Press: Cambridge MA.

Emerson, Michael, Karen Chai and George Yancey. 2001. "Does Race Matter in Residential Segregation? Exploring the Preferences of White Americans." *American Sociological Review* 66:922-35.

Farley, Reynolds, Elaine Fielding and Maria Krysan. 1997. "The Residential Preferences of Blacks and Whites: A Four-Metropolis Analysis." *Housing Policy Debate* 8:763-800.

Farley, Reynolds and William Frey. 1994. "Changes in the Segregation of Whites from Blacks During the 1980s: Small Steps Towards a More Integrated Society." *American Sociological Review* 59:23-45.

Farley, Reynolds, Charlotte Steeh, Maria Krysan, Tara Jackson and Keith Reeves. 1994. "Stereotypes and Segregation: Neighborhoods in the Detroit Area." *American Journal of Sociology* 100:750-80.

Fischer, Mary and Marta Tienda. 2006. "Redrawing Spatial Color Lines: Hispanic Metropolitan Dispersal, Segregation, and Economic Opportunity" p. 100-37 in *Hispanics and the Future of America* by Marta Tienda and F. Mitchell (eds). The National Academies Press: Washington, D.C.

Fossett, Mark. 1988. "Community-Level Analysis of Racial Socioeconomic Inequality: A Cautionary Note." *Sociological Methods and Research* 16:454-91.

Fossett, Mark. 2006. "Ethnic Preferences, Social Distance Dynamics, and Residential Segregation: Theoretical Explorations Using Simulation Analysis." *Journal of Mathematical Sociology* 30:185-274.

Fossett, Mark. 2009. "Casting Segregation as Group Differences on Residential Outcomes." Paper presented at the Session on Residential Segregation at the Annual Meetings of the Southern Demographic Association, Galveston, Texas, October 21-24.

Fossett, Mark. 2011. "Spatial Implementations of Mainstream Segregation Indices: Application to Assessing Segregation at Varying Scales." Presented at the Annual Meetings of the Southwestern Sociological Association, Las Vegas, NV, March 2011.

Fossett, Mark. Forthcoming. *New Methods for Measuring and Investigating Residential Segregation*. Unpublished monograph under review in the Springer Series on Demographic Methods and Population Analysis.

Fossett, Mark A. and Cynthia M. Cready. 1998. "Ecological Approaches in the Study of Racial and Ethnic Differentiation and Inequality" in *Continuities in Sociological Human Ecology* by Michael Micklin and Dudley L. Poston, Jr. (eds.). Plenum Press: New York.

Fossett, Mark and Amber R. Fox. 2013. "Residential Segregation and Group Differences on Social Characteristics: Limitations of Aggregate-Level Analysis and Alternative Options." Presented at the Annual Meetings of the Southern Demographic Association, Montgomery, AL, October 2013.

Fossett, Mark, Amber R. Fox and Daniel Powers. 2014 (forthcoming). "Fractional Logit Regression and Logit Quantile Regression: New Options for Modeling Bounded Variables with an Application to Investigating Anglo-Hispanic Segregation" *Sociological Methods and Research* (revision of paper presented at the annual meetings of the American Sociological Association, Denver, CO.)

Fossett, Mark, Amber R. Fox, Rogelio Saenz and Wenquan Zhang. 2014. "White-Latino Residential Segregation in New Destinations: Trends for Metropolitan, Micropolitan, and Non-Micropolitan Areas, 1990-2010." Presented at the Annual Meetings of the Population Association of America, Boston, MA, May 2014.

Fossett, Mark A. and K. Jill Kiecolt. 1989. "The Relative Size of Minority Populations and White Racial Attitudes." *Social Science Quarterly* 70:820-35.

Fox, Amber R. and Mark Fossett. 2013. "Assessing the Impact of Spatial Scale in Segregation Analysis" presented at the 93rd Annual Meetings of the Southwestern Sociological Association, New Orleans, LA, March 29

Frey, William H. and Reynolds Farley. 1996. "Latino, Asian, and Black Segregation in U.S. Metropolitan Areas: Are Multi-Ethnic Metros Different?" *Demography* 33:35-50.

Galster, George. 1990. "Racial Discrimination in Housing Markets During the 1980s: A Review of the Audit Evidence." *Journal of Planning Education and Research* 9:165-75.

Hall, Matthew and Jonathan Stringfield. 2014. "Undocumented Migration and the Residential Segregation of Mexicans in New Destinations." *Social Science Research* 47:61-78.

Harris, David. 1999. "'Property Values Drop When Blacks Move In, Because…': Racial and Socioeconomic Determinants of Neighborhood Desirability." *American Sociological Review* 64:461-79.

Harris, David. 2001. "Why Are Whites and Blacks Averse to Black Neighbors?" *Social Science Research* 30:100-16.

Iceland, John. 2004. "Beyond Black and White: Metropolitan Residential Segregation in Multi-Ethnic America." *Social Science Research* 33:248-71.

Iceland, John and Melissa Scopilliti. 2008. "Immigrant Residential Segregation in U.S. Metropolitan Areas, 1990-2000." *Demography* 45:79-94.

Iceland, John, Daniel Weinberg and Lauren Hughes. 2014. "The Residential Segregation of Detailed Hispanic and Asian groups in the United States: 1980-2010." *Demographic Research* 31:593-624.

Iceland, John, Daniel H. Weinberg, and Erika Steinmetz. 2002. *Racial and Ethnic Residential Segregation in the United States: 1980-2002*." U.S. Government Printing Office, Washington, D.C.

Iceland, John and Kyle Anne Nelson. 2008. "Hispanic Segregation in Metropolitan America: Exploring the Multiple Forms of Spatial Assimilation." *American Sociological Review* 73:741-65.

Jackman, Mary. 1977. "Prejudice, Tolerance, and Attitudes toward Ethnic Groups." *Social Science Research* 6:145-69.

James, David R. and Karl E. Taueber. 1985. "Measures of Segregation." Pp. 1-32 in *Sociological Methodology 1985*, edited by Nancy B. Tuma. Jossey-Bass: San Francisco CA.

Jones, F.L. and Jonathan Kelley. 1984. "Decomposing Differences between Groups: A Cautionary Note on Measuring Discrimination." *Sociological Methods and Research* 12:323-43.

Kieschnick, Robert and BD McCullough. 2003. "Regression Analysis of Variates Observed on (0, 1): Percentages, Proportions and Fractions." *Statistical Modeling* 3:193-213.

Kitagawa, Evelyn M. 1955. "Components of a Difference Between Two Rates." *Journal of the American Statistical Association* 50:1168-94.

Krysan, Maria. 2002. "Whites Who Say They'd Flee: Who Are They, and Why Would They Leave?" *Demography* 39:675-96.

Krysan, Maria and Reynolds Farley. 2002. "The Residential Preferences of Blacks: Do They Explain Persistent Segregation?" *Social Forces* 80:937-80.

Lieberson, Stanley. 1981. *A Piece of the Pie: Black and White Immigrants Since 1880*. University of California Press: Berkeley CA

Lichter, Daniel and Kenneth Johnson. 2009. "Immigrant Gateways and Hispanic Migration to New Destinations." *International Migration Review* 43:496-518.

Lichter, Daniel T., Domenico Parisi, Michael C. Taquino and Steven Michael Grice. 2010. "Residential Segregation in New Hispanic Destinations: Cities, Suburbs, and Rural Communities Compared." *Social Science Research* 39:215-30.

Logan, John. 1978. "Growth, Politics, and the Stratification of Places." *American Journal of Sociology* 84:404-16

Massey, Douglas. 1985. "Spatial Assimilation as a Socioeconomic Outcome." *American Sociological Review* 50:94-106.

Massey, Douglas. 2001. "Residential Segregation and Neighborhood Conditions in U.S. Metropolitan Areas" in *America Becoming: Racial Trends and Their Consequences, Volume 1* by Neil J. Smelser, William Julius Wilson, and Faith Mitchell (eds.). National Academy Press: Washington D.C.

Massey, Douglas S. and Nancy A. Denton. 1987. "Trends in the Residential Segregation of Blacks, Hispanics, and Asians: 1970-1980." *American Sociological Review* 52:802-25.

Massey, Douglas S. and Nancy A. Denton. 1988. "The Dimensions of Residential Segregation." *Social Forces* 67:281-315.

Massey, Douglas S. and Nancy A. Denton. 1989. "Hypersegregation in U.S. Metropolitan Areas: Black and Hispanic Segregation along Five Dimensions." *Demography* 26:373-91.

Massey, Douglas S. and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Harvard University Press: Cambridge MA.

Massey, Douglas and Garvey Lundy. 2001. "Use of Black English and Racial Discrimination in Urban Housing Markets: New Methods and Findings." *Urban Affairs Review* 36:452-69.

Massey, Douglas and Brendan Mullen. 1984. "Processes of Hispanic and Black Spatial Assimilation." *American Journal of Sociology* 89:836-73.

Papke, L.E. and J.M. Wooldridge. 1996. "Econometric Methods for Fractional Response Variables with an Application to 401(k) Plan Participation Rates." *Journal of Applied Econometrics* 11:619-63.

Park, Robert E. and Ernest W. Burgess. 1925. *The City*. The University of Chicago Press: Chicago.

Portes, Alejandro and Min Zhou. 1993. "The New Second Generation: Segmented Assimilation and Its Variants." *Annals of the American Academy of Political and Social Science* 530:74-96.

Powers, Daniel A., Hirotoshi Yoshioka, and Myeong-Su Yun. 2011. "mvdcmp: Multivariate Decomposition for Nonlinear Response Models." *The Stata Journal* 11:1-21.

Purnell, Thomas, William Idsardi and John Baugh. 1999. "Perceptual and Phonetic Experiments on American English Dialect Identification." *Journal of Language and Social Psychology* 18:10-30.

Rosenbaum, Emily. 1996. "The Influence of Race on Hispanic Housing Choices: New York City, 1978-1987." *Urban Affairs Review* 32:217-43.

Ross, Stephen and Margery Turner. 2005. "Housing Discrimination in Metropolitan America: Explaining Changes between 1989 and 2000." *Social Problems* 52:152-80.

Saenz, Rogelio. 2010. "Latinos in American 2010." *Population Bulletin Update*

Schill, Michael and Samantha Friedman. 1999. "The Fair Housing Amendments Act of 1988: The First Decade." *Cityscape: A Journal of Policy Development and Research* 4:57-78.

Scopilliti, Melissa and John Iceland. 2008. "Residential Patterns of Black Immigrants and Native-Born Blacks in the United States." *Social Science Quarterly* 89:551-72.

Siordia, Carlos and Amber R. Fox. 2012. "Public Use Microdata Area Fragmentation: Research and Policy Implications of Polygon Discontinguity." *Spatial Demography* 1:41-55.

Taueber, Karl and Alma Tauber. 1964. *Negroes in Cities: Residential Segregation and Neighborhood Change*. Anatheum: West Hanover PA.

Turner, Margery Austin. 1992. "Discrimination in Urban Housing Markets: Lessons from Fair Housing Audits." *Housing Policy Debate* 3:185-216.

White, Michael J. 1986. "Segregation and Diversity: Measures in Population Distribution." *Population Index* 52:198-221.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. The MIT Press: Cambridge MA.

Yinger, John. 1998. "Evidence on Discrimination in Consumer Markets." *The Journal of Economic Perspectives* 12:23-40.

Yu, Zhou and Dowell Myers. 2007. "Convergence or Divergence in Los Angeles: Three Distinctive Ethnic Patterns of Immigrant Residential Assimilation." *Social Science Research* 36:254-85.

Zhou, Min. 1997. "Segmented Assimilation: Issues, Controversies, and Recent Research on the New Second Generation." *International Migration Review* 31:975-1008.

Zoloth, Barbara S. 1976. "Alternative Measures of School Segregation." *Land Economics* 52:278-98.

Zubrinsky, Camille and Lawrence Bobo. 1996. "Prismatic Metropolis: Race and Residential Segregation in the City of Angels." *Social Science Research* 25:335-74.